

HP Professional

FEBRUARY 1997

HP-UX

Windows NT

MPE/iX

A Cardinal Publication

1997 HP SERVER REVIEW

HP 9000 Ups The Ante

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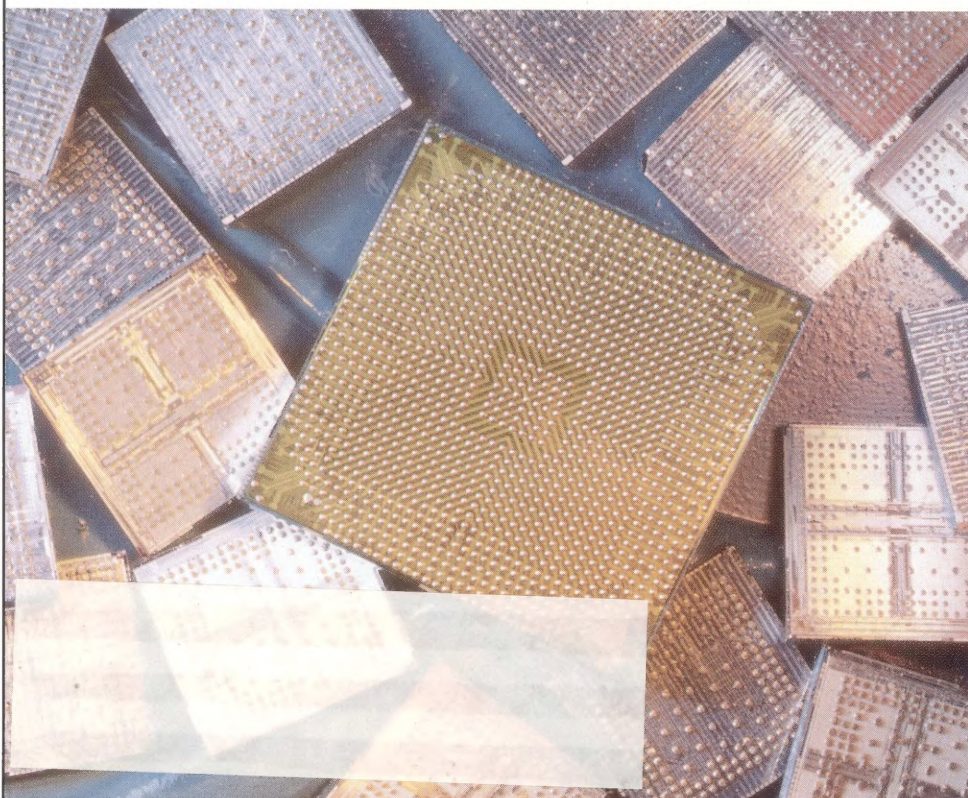
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"The promise of UNIX/RISC has never been fulfilled. It's not open; never has been."

John T. Rose,
Compaq Senior VP and GM,
Enterprise
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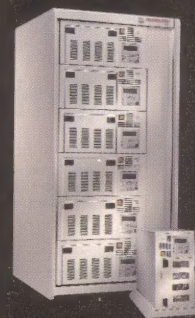
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One minute per wipe, about 28 minutes per week, almost 26 hours per year wiping coffee. The hour going to the store to buy a new coffee maker will save 25 hours over the year. Now, that's a good return. So is using the HP-UX 10.x upgrade tools. In fact, (dare we) they're good to the last. 34

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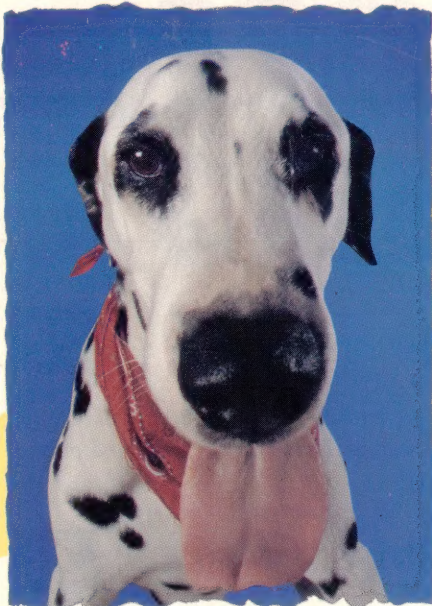
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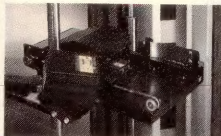
Another reason to trust ATL is its years of successfully meeting the DLT automated tape library needs of the midrange UNIX world. That's why, for its HP9000 server family backup system of choice, HP selected ATL Products as its exclusive DLT automated tape library reference partner.

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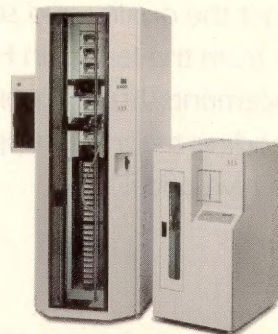
which combines features like the IntelliGrip cartridge handling system and ATL specified DLT drives, resulting in the industry leader in reliability and data availability. DLT experience counts!

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Hooked On Dweebonics

As a chip head, how many times have you felt that you just don't fit in? Like you're missing out on something in society, or life in general. Have you felt substandard, maybe even — obsolete?

For example, last summer when those people who work outside your little white room asked you to go surfing. You sat at home alone all day in front of a gray haze. The next day you discovered that your co-workers all returned from some place called "the shore", with a strange skin discoloration.

Or when cuddling up with that someone special this winter in front of the fire and they say, "How about we put another log on?" You chuckle and say, "Log-on? How? There isn't a X-term for gigamiles, tee-hee." Later in the evening, they ask if you practice safe sex. "Of course," you blush. "There's a virtual reality system in the next room that's 'hot-swappable.'" Judging by the reaction, you know you just made a major faux pas (French for screw-up), and you realize you just ain't speaking the same language. Panicking, you blurt out, "How about end-to-end data integrity? Or perhaps a task-based, event-driven workflow management tool?" — as they walk out of your life forever.

But it's not your fault you can't communicate, or that the only job you can get is in a cold, sterile chamber with a bunch of buzzing boxes. Trust me, you're not to blame.

So, just who or what *is* to blame for the fact you have no functionality in society? I'll tell you — The System. No, not that system, you propeller head. The educational system. A system that denied you as a child, your right to a suitable education from teachers who understand and speak *your* language. And brother, I don't mean COBOL.

It's time chip heads in the computer industry stood up and accepted who they are and affirm their propeller-headedness with their own language — Dweebonics. Yes, Dweebonics, from the Olde English FORTRAN — Dweeb, meaning geek or goober; and phonics, meaning something to do with words. I've spent over a week in exhaustive research. And call it what you want: Tech-Speak, slang or like so many of the misinformed — jargon, but Dweebonics is a language.

I ax you, sorry, wrong bonics argument. I ad hoc query you — Don't all children of the cyber age have the right to a proper education? Just because we were robbed of a fair chance doesn't mean it's too late for a complete system recovery.

When I see the ignorance of our educational community, I find myself ROFL. Today's teachers should be programmed to interface with the techie student by jamming on the protocol du jour. Are today's inner city weenies given the direct access to data that cool kids and the jocks are getting? I'm not talking about just frobbing the system. I mean, if we're going to reformat, there's no sense in going at it half duplex.

DA PLAN

Dweebonics calls for the development of an academic program to instruct geeky students in their primary language — their primary language being nonstandard English, or Dweeb. Therefore, I urge Education Secretary Richard Riley to approve bilingual education funds to help teachers throughout America improve the standard English skills of their nerd students.

But before we do anything, we must have a plan. Once we have a plan, we need someone to execute that plan. The prime candidate must be someone who understands the plan and can implement it. It is also important that they can work with others. If the person you select to execute the plan is unsuccessful, select a new person who can implement the plan and work equally as well with others.

(Continued on page 48)



**Charlie
Simpson**

INDUSTRY WATCH

George A. Thompson

NEW PENTIUM PROVES YOU CAN NEVER BE TOO MEDIA RICH

Take an Intel Pentium CPU. Add 57 new instructions specifically designed to manipulate and process video, audio and graphical data efficiently. While you're at it, double the on-chip cache size to 32KB. And 1 million more transistors later — viola — you have a Pentium CPU with MMX technology as Intel calls it. On January 8, Intel introduced its much touted Pentium CPU with MMX technology which is expected to improve performance on so-called "media-rich applications."

The initial shipments of 166MHz and 200MHz clock speeds have already landed in consumer desktops. For example, HP's Pavilion PCs (its home models) with the new Pentium MMX have been sitting on store shelves since January, and new models are expected this month (perhaps by the time you read this). Business users, on the other hand, will be using 150MHz and

A T P R E S S

HP AND CISCO SYSTEMS MAKE NICE

HP picked up yet another partner in January by announcing an "extended alliance" with Cisco Systems Inc. (San Jose, Calif.), the leading internetwork vendor. According to the deal, the two companies will expand or begin collaboration in four areas: technology development, product integration, professional services, and customer service and support. Some of their plans include: integrating Cisco's Resource Reservation Setup Protocol (RSVP) into HP-UX, and Cisco's Gigabit Ethernet into the next generation of high-speed system interfaces for the HP 9000 servers; cooperating on Internet security protocols; and integrating HP's OpenView and Cisco's CiscoWorks network management products. HP's Lew Platt referred to the alliance as HP's "most important partnership."

166MHz versions of the chip designed specifically for notebook PCs. However, HP intends to integrate the new CPU into both forthcoming HP Vectra desktops and HP OmniBook notebooks. The two speeds of processors are also offered as individually boxed products for systems integrators and value-added resellers through Intel distributors.

You can expect the MMX technology to show up in future Intel processors, including the Pentium OverDrive processors, the first of which will be introduced in the first half of this year for upgradeable Pentium CPU-based systems. Pricing for the 166 MHz and 200MHz Pentium processors (in 1,000-unit quantities) are \$407 and \$550, respectively. The

150MHz and 166 MHz notebook versions (in 1,000-unit quantities), reflecting a premium for the

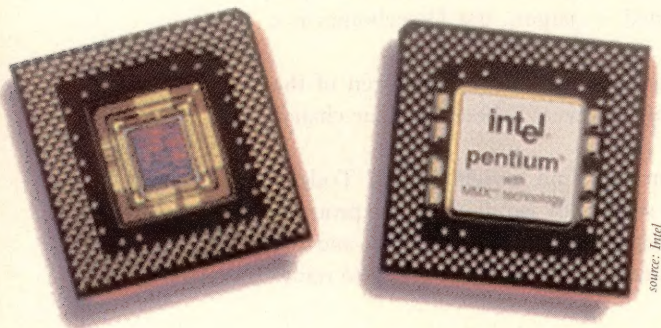
lower voltage operation required for notebook computers, are priced at \$443 and \$550, respectively.

AS EASY AS ONE, TWO, R/3

HP introduced a service for pre-loading, pre-configuring and pre-testing SAP R/3 solutions prior to delivery to customer sites. HP is the only SAP partner to offer this service for HP-UX, Microsoft Windows NT or mixed HP-UX/Windows NT system OS environments. The new service allows HP customers to reduce onsite installation time and minimize disruption to core business activities.

HP delivers a pre-integrated solution to the customer, including R/3 and database software, HP 9000 business servers or HP NetServer PC servers and other solution components. The HP facility handles the complex logistics of delivering the new system to customer sites, including multiple deliveries in one country or several countries around the world.

The actual pre-loading activities are conducted by HP technicians at a central HP facility. The facility provides high levels of standardization across processes and multivendor technolo-



Intel's new Pentium with MMX technology (which actually doesn't stand for multimedia extensions), like all Intel Pentium processors, is backward compatible through the 386. However, 57 new instructions have been added to handle the increasing video, audio and graphics being added to today's applications. According to Intel's media benchmark, which measures multimedia performance, the new CPU runs more than 60 percent faster than it does on the original Pentium processor at the same clock speed.

Several other micro-architectural enhancements include: a doubling of code and data caches to 16K each; improved branch prediction; enhanced pipeline; and deeper write buffers. So a Pentium with MMX technology runs current software 10 percent to 20 percent faster than the original Pentium processor at the same clock speed.

gies, leading to enhanced quality, faster response times and reduced costs due to economies of scale. HP's technicians are trained, certified and experienced and have access to the most up-to-date technologies, including the latest patches, releases and updates.

HP's European Integration Center, located in L'Isle d'Abeau, near Lyon, France, has been performing integrations and internationally deploying customized solutions since 1992, and is the first HP facility to offer this service for SAP systems. In the United States, the Americas Integration Center in Roseville, Calif., is expected to offer this service in the spring of 1997.

HP OPENVIEW OMNIBACK RECEIVES SAP CERTIFICATION

This past December, HP announced that HP OpenView OmniBack II is one of the world's first backup solutions to receive SAP R/3 certification for both Microsoft Windows NT and HP-UX. Certification with SAP's client-server business application solutions is expected to provide customers with a high-performance backup and restore solution that provides 24x7 application availability. HP OpenView OmniBack II is currently available and can be purchased through all major direct sales channels for \$3,500.

TRAVEL THE HP WAY

According to Dataquest, the total size of the U.S. market for IT products and related services in 1995 was \$213 billion. The transportation and travel industry constituted approximately 5 percent of this figure — that's about \$11 billion if you're counting. Well, HP certainly is counting on the transportation and travel industry to turn to outside IT expertise when those segments get around to business process re-engineering. That's why HP formed the Transportation and Travel Group in January.

Companies such as United Airlines, Southwest Airlines, Delta Air Lines, Lufthansa Airlines, FedEx, DHL, ITT Sheraton Hotels, Hertz Corp. and TNT Express Worldwide are gradually transforming their current computer

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HOT JOBS FOR 1997

Job Title	Predicted Growth (increase in the number of requests to fill a position)	Hot Because
Temporary Executive	314%	It has got to be done now!
Internet Software Architect	198%	Who has these skills? Who can keep the ones who do?
Chief Marketing Officer	178%	Marketing is important now.
Healthcare CIO	121%	It's underinvested and understaffed.
The Internet Executive	99%	They don't exist?
Chief Technology Officer (CTO)	96%	You need to be both visionary and technical.
Vice President — Year 2000	96%	The clock is ticking.
Start-up CEO	81%	There's an overabundance of venture capital.
Executive Search Consultant	76%	Someone's got to find people to fill all those hot jobs.
Security Analyst	75%	Stocks are the name of the game these days.
Vice President Staffing	74%	Companies are realizing that they must do a better job of hiring great people.
Information Technology Consultant	68%	Good ones are always hard to find.
Vice President — Call Centers	51%	Companies are outsourcing service and inbound/outbound telemarketing.

Compiled by Christian and Timbers Inc. (C&T; New York, N.Y.), the Hot Jobs for 1997 represents a compilation of the most requested and least requested positions to be filled in the executive ranks. From January through November 1996, C&T tracked personnel interviews and search requests from clients, as well as surveys from employment advertising and journals.

systems into open and flexible enterprise computing environments.

The new Transportation and Travel Group is helping transportation and travel companies manage these new services and become even more competitive by assisting them in revamping the information-technology and computer-systems foundations upon which their businesses are based. HP believes that the specific technology areas in

which transportation businesses will be investing in the near future include: ticketless travel; Internet access; enterprise messaging; customer reservation systems; and just-in-time maintenance.

HP is already heavily involved with travel and transportation industries. Southwest Airlines, one of the first to introduce ticketless travel, runs its program on high-end HP servers connected to 3,000 PCs in airports across the

country. HP helped Southwest Airlines design the computer network for this application as part of an expanded high-availability solution. DHL Worldwide Express, a package-delivery company competing with FedEx and UPS, uses HP's UNIX system servers and outsources the management of systems, storage, server backups, security and LANs to HP. FedEx currently is working with HP on the implementation of a range of Intel- and UNIX-based system computing products. As part of the PC purchase agreement, HP desktop PCs will become one of the standards for high-volume customers using FedEx POWERSHIP automated shipping systems.

GET BRIGHT AND WIN AN HP PRINTER FROM THE INTERNET

If you use the Internet, you could win an HP LaserJet 5L-FS. America's Brightest, a subscription-based Internet service that delivers a package of business and career resources, has teamed with HP to provide three HP LaserJet 5L-FS printers to anyone entering their jointly sponsored Internet Printing Sweepstakes. One winner per month will be selected randomly from registered entries from Jan. 15, 1997 through April 15, 1997.

America's Brightest recently was

VERBETA

**It's our market now,
and we plan to
continue driving it.**

— Edward Zander,
president of Sun Microsystems, in response to
Sun's market share jump and HP's slip.

featured in USA Today's "Hot Sites," C/NET's "The Web" and NBC's syndicated Internet program "Net Surfing." According to David Lorenz, product manager at HP's North American Hardcopy Marketing Center, "This sweepstakes is designed to let Internet users know about today's HP LaserJet printers. The printers allow smaller businesses and individuals to produce documents that have the same professional quality as those from larger companies — but for a small fraction of the cost.

No purchase is necessary. Internet users who wish to enter the sweepstakes may complete an official entry form at America's Brightest Web site — www.americasbrightest.com.

IT'S OFFICIAL: HP DRINKS FROM THE WORLD CUP

After more than a year of direct involvement, HP finalized an agreement with the French Organizing Committee of the 1998 World Cup to become the official information-technology hardware and maintenance supplier to the World Cup soccer tournament, one of the largest sports media events of the century.

As an official World Cup '98 supplier, HP will develop an integrated hardware solution for the World Cup's mission-critical applications. Working with the other World Cup '98 technology suppliers, EDS, France Telecom and Sybase, HP will help create an information management infrastructure for handling game scoring, media centers, personnel accreditation, hotel information, and various ticketing, stadium, warehouse and back-office operations.

The 1998 World Cup tournament (held from June 10 through July 12, 1998) will be held in 10 cities throughout France and will draw an estimated 37 billion TV viewers worldwide during the 64 scheduled games. Team qualifications for World Cup '98 began in April 1996 with 172 teams.

NEW RAID CLASSIFICATIONS

HP, along with many other computer systems and disk array manufacturers, has endorsed three new classifications for disk systems based on their data availability properties. Developed by the RAID Advisory Board (RAB; St. Peter, Minn.) the new categories replace RAID Levels 1 through 5, which were established in 1993. The three new classifications are **Failure Resistant Disk Systems (FRDS)**, **Failure Tolerant Disk Systems (FTDS)**, and **Disaster Tolerant Disk Systems (DTDS)**. Each classification also includes a premium "+" level (FRDS+, FTDS+, DTDS+) which requires protection against environmentally-related and other kinds of failures. To obtain a classification in each category, a disk system must meet all of the 21 criteria.



According to a recently published survey conducted for the Business Software Alliance (BSA) and the Software Publishers Association (SPA), worldwide software piracy losses are estimated at \$13.1 billion in 1995, a 9 percent increase over the \$12.2 billion estimate for 1994. Not surprisingly, the newly independent Eastern European countries have the highest overall piracy rates, with an average of 83 percent, which resulted in a loss of \$750 million. The highest rates were reported in Slovenia (96%), Russia and Bulgaria (94%) and Romania (93%). The lowest regional piracy rate was seen in North America, with an average of 27 percent. But the United States had the largest revenue loss with \$2.9 billion.

The overall piracy "rate" declined in 1995 to 46 percent, meaning that less than half of all new software installations were stolen. That could be in part to the BSA's anti-piracy advertising and strict enforcement policies.

According to a Special Technology Report on ATM by Mier Communications (Princeton, N.J.), pricing for ATM equipment continues to drop. But you probably knew that. However, what you might not know is that pricing still varies widely in the ATM switch market, while prices for ATM adapters have stabilized. Worldwide, Mier estimates that the number of all ATM switches shipments, including conversion and adaptation devices with ATM "uplinks" — installed as of January 1, 1997, to be around 45,000 and the number of switch ports at around 215,000 — up from 85,000 ports last year.

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Hewlett Packard	Sony	VHS
IBM	StorageTek	3590
	others	others

And the best part is AMASS is so easy to use. The automated library is presented as a single UNIX file system under one mount point compatible with NFS. Your applications simply read and

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CIRCLE 296 ON READER CARD

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Bentley Engineers Data Integration



MODEL SERVER PUBLISHER & CONTINUUM

- ModelServer Publisher doesn't require changes to existing workflows
- ModelServer Continuum creates a "contiguous" database of engineering and enterprise data
- ModelServer Publisher:
Single-channel \$9,950
Multichannel \$24,500
ModelServer Continuum:
\$37,500

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CIRCLE 354 ON READER CARD

Many business sectors unite their desktop systems and data with enterprise IT systems and databases. But until recently, those in engineering were left out of the loop. Enter Bentley Systems Inc. (Exton, Pa.) with their new line of Web-enabled middleware products, called Engineering Back Office. The new server products, including ModelServer Publisher and ModelServer Continuum, allow engineering data to be stored in corporate databases, integrated with enterprise data and served to enterprise clients, including desktop applications and Web browsers. According to Yoav Eitel, Bentley's senior vice president of marketing, engineering automation has traditionally remained separate

from corporate IT and has remained that way, because there was no compelling reason to change. But now, he continues, globalization is pushing organizations to merge these two areas together.

ModelServer Publisher electronically publishes Bentley's MicroStation or Autodesk's AutoCAD drawings maps and models to any Web browser-based desktop. It works on-demand from centrally stored data. Implementation of ModelServer Publisher doesn't require changes to existing workflows. It can work over intranets for distribution throughout the enterprise and over the Internet to the extended enterprise and public.

ModelServer Continuum creates a "contiguous" database of engineering and enterprise data by storing engineering maps and drawings in corporate IT databases and "serving up" data to MicroStation application and Web clients. Because it offers a seamless presentation of data, it also eliminates map file boundaries. For example, an electrical utility company often has thousands of tiled maps. Previously, a maintenance worker attempting to trace a power line could only

view each tile in isolation. With ModelServer Continuum, that worker gets a seamless presentation of the full network of power lines with no breaks or file boundaries.

ModelServer Continuum also: minimizes collisions through record-level locking; has long transaction management, which coordinates and resolves collisions that occur in extended work sessions in multiuser environments; and features project branching, allowing users to experiment with new ideas and later synchronize their changes with the project if necessary.

Also planned is ModelServer TeamMate, which will provide server-based engineering document and workflow management

ModelServer Publisher costs \$9,950 (per server) for a single-channel version which serves one client at a time and includes a copy of Netscape FastTrack Server. The multichannel version, which serves any number of concurrent clients, is \$24,500 (per server) and includes a copy of Netscape Enterprise Server. ModelServer Continuum costs \$37,500 (per server).

—Deborah Schwartz,
Associate Editor

Seeing Is Believing

DOUBLEVISION 2.0.00

Terminal	User	Term Type	Trans	Status
ttys0	april	ansi	GOOD	Yes
ttys1	AT LOGIN	unknown	POOR	No
ttys2	AT LOGIN	unknown	POOR	No
ttys3	brian	ansi	GOOD	No
ttys4	john	ansi	GOOD	No
ttys5	john	ansi	GOOD	Yes
ttys6	john	ansi	GOOD	No
ttys7	brian	ansi	GOOD	Yes
ttys8	ccanup	ansi	GOOD	Yes
ttys9	yves	ansi	GOOD	PRE
ttys10	yves	ansi	GOOD	PRE
ttys11	john	ansi	GOOD	Yes/No
ttys12	john	ansi	GOOD	No
ttys13	john	ansi	GOOD	PRE

DOUBLEVISION

- Provides full access to the attached computers' screen and control over its keyboard
- Available for HP-UX 8.0 to 10.10
- Prices range from \$395 to \$1,595

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CIRCLE 352 ON READER CARD

A frustrated company employee calls the system administrator three times in one hour, attempting to describe a problem with some new software. It's difficult, even impossible, to explain in words what's on the screen. But with the introduction of DOUBLEVISION for Character Terminals from Maxtech (Kennesaw, Ga.), there is finally a response to the phrase, "If you could see what I see."

DOUBLEVISION 2.0 is the latest version of Maxtech's remote control software for UNIX character terminals. DOUBLEVISION allows you to connect to another terminal (TTY or pseudo-TTY) and have full access to its screen and full control over its keyboard. For JoAnn Walker, Help Desk manager at Kindercare Learning Center's Corporate

Support Center (Montgomery, Ala.), DOUBLEVISION has become an invaluable resource. Walker and her staff, who use HP-UX systems, field calls from over 1,000 Kindercare centers nationwide. Each week, employees log into a national database from their remote locations to complete financial reports.

"If they run into a problem with balances or transactions," she says, "and they can't figure out what's going on, I can see exactly what they see and instruct them more quickly than asking questions." DOUBLEVISION eliminates the need for lengthy verbal descriptions. With DOUBLEVISION, you can just say, 'I'm going to log on with you,' and once you do, you can see exactly what's going on."

Is it difficult to log onto a screen in California from Alabama? According to Walker, "It's very easy. One UNIX command will get us onto their screen." Walker enters a UNIX command to identify where the satellite center has logged onto the database, then inputs a DOUBLEVISION command to attach to the terminal. DOUBLEVISION is installed on the machine that runs the application you want to control. Log in to that

machine, start DOUBLEVISION, and you can view any terminal or device connected to that machine.

While Kindercare's helpdesk staffers do not take control of the user's keyboard, DOUBLEVISION does offer complete control over both host (the user being viewed) and remote (the user who is viewing) keyboards. Both keyboards can be left unlocked, which allows the host and remote user to interact with the program running on the host's terminal on a "first come, first serve" basis. Security also has been addressed. DOUBLEVISION also lets the root user assign a password that all users must provide before running DOUBLEVISION.

DOUBLEVISION for Character Terminals is available for many common UNIX platforms, including HP-UX and HP-UX-MP 8 to 10.10, SCO Xenix and UNIX, IBM AIX, UnixWare, NCR UNIX, DG/UX, Sun Solaris and Unisys UNIX. DOUBLEVISION is priced per machine, with unlimited log-ins. There are three price levels, ranging from \$395 to \$1,595, based on the systems and processors.

—David Acord,
Contributing Author

Lost And Found Backups



PATROL & SQL BACKTRACK

- SQL-BackTrack for DataTools provides database-aware backup and recovery for Oracle or Sybase
- Knowledge Modules automate the management, monitoring and tracking of SQL backup and recovery
- PATROL Recovery Manager allows backup and recovery of logically related groups of database objects across multiple databases

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CIRCLE 351 ON READER CARD

Data sometimes gets lost. And that is why the serious computer user installs a backup system. But even when the data has been saved, it cannot always be retrieved as easily or quickly. To that end, BMC Software (Houston, Texas) created a multi-tiered solution for enterprise backup and recovery management.

The first tier includes utilities for host-based database systems including IMS, DB2 and VSAM. In open systems environments, BMC resells SQL-BackTrack Version 2.0 for Oracle which improves and speeds backup and recovery by reading and writing less data. Version 2.0 is available on the following platforms: HP 9000 running HP-UX 9 and 10; Sun SPARC running Solaris or SunOS; IBM RS/6000 or SP2 running AIX; and it sup-

ports Oracle7, as well as the Oracle Parallel server on the IBM SP2. The product starts at \$4,595.

In the second tier, BMC combines its own PATROL recovery manager with SQL-BackTrack to form Knowledge Modules (KM) for Oracle or Sybase to automate the management, monitoring and tracking of SQL backup and recovery via the PATROL console, along with other applications' PATROL monitors.

KMs feature SQL-BackTrack images and the Oracle or Sybase instances on servers where the PATROL agent is installed, and gives the administrator an overview of the whole system. The PATROL console also gives a GUI display of the SQL's interactive parts, such as control files and guided recovery. The agent can monitor all backup and recovery jobs to let the administrator know the status of those jobs. This gives the administrator a warning if a job fails, which helps them avoid incomplete backups and inaccurate recoveries. It also logs major events that happen during the monitoring of SQL requests and structures.

These KMs, which start at \$125, support: UNIX, Windows NT and Windows 95 clients; the Sybase SQL Server 4.9.2, Sybase System

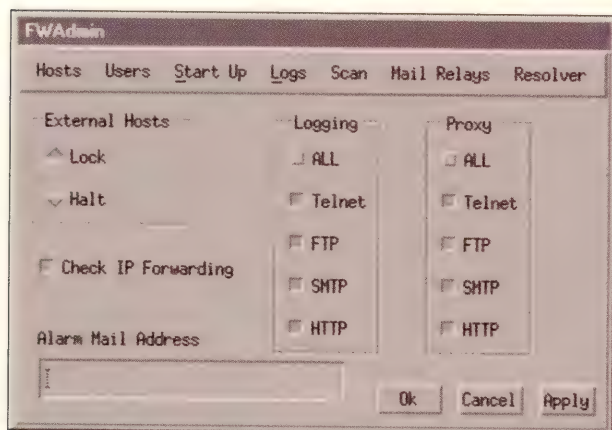
10 and Oracle 7.x databases; IBM RS/6000 AIX 3.5, HP 9000 HP-UX 9 and 10, and Sun SPARC Solaris 2.2; and SQL-BackTrack for Sybase 2.1 and for Oracle 1.2.

At the third level, PATROL Recovery Manager lets the user back up and recover logically-related groups of database objects across multiple databases. The recovery assets catalog gives information needed to get back specific instances of a database, including backup histories, and actions and assets needed for recovery, like control or log files, or the order of recovery.

The PATROL Recovery Manager requires SQL-BackTrack for Oracle or Sybase, and one or more of the following Open Backup Stream Interfaces: disk, tape, Legato NetWorker, IBM ADSM or AT&T CommVault. It supports the Windows NT, Windows for Workgroups, Windows 95 and Windows 3.1 clients. The database, UNIX and utilities supported match that of PATROL SQL-BackTrack KMs. The recovery manager console costs \$3,500, while the server component starts at \$350.

—Steve Berlin,
Contributing Author

All's Safe On The Internet Front



NORMAN FIREWALL

- ▶ Integrated with HP-UX 10.09.01 CMW
- ▶ Has two isolated network interface cards
- ▶ Supports TCP/IP, UDP, ARP, SMTP, telnet, ftp and http

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CIRCLE 353 ON READER CARD

The U.S. government is a big collector and disseminator of information. And it needs to perform these functions safely. One product being used is Norman Firewall, a result of a joint effort between HP and Norman Data Defense Systems (Fairfax, Va.). The Norman Firewall controls Internet access via proxies for Web browsing, e-mail, file transfer and remote telnet. It is expected to be available soon under GSA contract in the United States.

The Norman Firewall offers integrated anti-virus and hot-word scanning. It can screen out more than 9,200 viruses and their variants, even in compressed files. Additionally, the firewall's hot-word scanning allows administrators to scan transmitted files for key

words, such as sensitive project names.

A critical security feature is its integration with HP's B1-level operating system, HP-UX CMW. The HP-UX 10.09.01 CMW OS offers Mandatory Access Control (MAC), Discretionary Access Control (DAC), least privileges, auditing sensitivity labeling, information labeling, trusted path, import/export, multilevel directories, authentication database, object reuse, integrity checking, trusted recovery and MaxSix 3.0 (secure networking supporting process communication). B1-level networking transparently propagates special security attributes of files and other objects throughout the network and to remote sites.

Norman Firewall provides filters for protocol, origin IP address, destination IP address, port, physical device, user ID and permission, and network security labels. It also includes a configurable protected audit subsystem and an encrypted protected password database. Object reuse ensures deleted data and closed sessions stay that way. Labels assign a level of protection for every device and file, and a level of authorization for every user and program. The administrator assigns hierarchical levels,

compartments, groups, owners and others, as well as allow or deny access between any one file or device and any one user or program.

The dual-home B1 firewall is a system that has two isolated network interface cards. One interface card connects to the external network, while the other connects to a trusted internal network. With this configuration, all data must go through the application proxies. The application proxy is an application packet filter program that provides access control based on the type of application.

The Norman Firewall attaches Ethernet LANs to the Internet via dial-up or dedicated 56KB or T1 lines. It adheres to IEEE 802.2 and 802.3, FDDI, 10BaseT, 10Base2, 10Base5 and UTP. And supported protocols include: TCP/IP, UDP, ARP, SMTP, telnet, ftp and http. It is compatible with Novell, LAN Manager, Windows NT and Advanced Server, Banyan Vines, OS/2, MS-DOS 3.1+, Windows 3.1 and Windows 95, SVR4 UNIX, BSD UNIX, SCO UNIX, HP-UX, Apple Macintosh, VAX/VMS, and IBM 3270 and SNA LAN.

—Deborah Schwartz,
Associate Editor

Development Is In The NatStars



NATSTAR

- Automates the creation and validation of user interfaces as well as associated procedures
- Supports the OSF's DCE and the OMG's CORBA 2.0 standards
- \$8,500 per developer for a primer package of five \$7,000 per developer for 30 or more

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CIRCLE 307 ON READER CARD

First-generation client-server tools may work well in departmental scenarios, but fail to deliver the performance and scalability required in large, heterogeneous environments. Second-generation tools provide a means to develop distributed client-server applications, but tend to rely on a proprietary programming language, do not scale well or require extensive consulting.

Nat Systems International's (McLean, Va.) NatStar information modeling capability enables developers to build and manage reusable data models, supporting traditional entity-relationship and object-oriented modeling approaches, including encapsulation, inheritance and polymorphism. Additionally,

its process modeling feature allows visualization and validation of application behavior through a workflow model that integrates the interface and data modeling capability. The resulting prototype evolves into a working application rather than a standalone in a separate construction process.

NatStar's graphical builder automates the creation and validation of user interfaces, as well as associated procedures. The product's integrated debugging facility allows for code testing in an interpretive and compiled mode.

NatStar produces compilable output in C. It also supports Object Query Language (OQL), the Object Management Group's (OMG) standard for object-oriented databases, allowing the generation of SQL across all databases. It allows for application deployment to all platforms across the network, as well as the ability to be partitioned to multiple tiers, including native mainframe support. Generated applications contain requests for services (presentation, application and data services) that translate application requests to the specifics of the execution environment via portable libraries.

The definition of the link between logical and physical servers is built dynamically, enabling the deployment of “smart pointers” to multiple servers.

NatStar supports management frameworks from companies such as Tivoli Systems, HP, SunSoft, Microsoft, Bull, Unisys, ICL, Digital and IBM, and supports the OSF's DCE and the OMG's CORBA 2.0 standards. The product's presentation support includes support for all versions of Windows, as well as MS-DOS and Macintosh.

Application server support includes Windows[®] NT, OS/2, HP-UX 9.0x and 10.0x, IBM AIX, SunOS and Solaris.

Database servers supported include DB/2, Oracle, Sybase, Ingres, Informix and ODBC. In addition to communication support for TCP/IP and NetBios, NatStar provides native support for SNA, LU0 and LU6.2.

Pricing begins at \$8,500 per developer for a development primer package of five, or \$7,000 per developer for development teams of 30 or more members.

—Deborah Schwartz,
Associate Editor

Compaq Climbs Aboard The Enterprise



"We are seeing many customers, that have been [previously using] UNIX/RISC systems, now using the client-server model with the x86 architecture."

John T. Rose,
Compaq's Senior Vice
President and General
Manager, Enterprise
Computing Group

Compaq Computer Corp.

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CIRCLE 331 ON READER CARD

"Welcome to the Enterprise." That might well be an official greeting on a sign above the front door at Compaq Computer corporate headquarters these days. That's because Compaq (Houston, Texas), the erstwhile portable-only computer manufacturer has grown from a struggling entrepreneurial PC startup into a crackerjack corporate entity capable of taking on the enterprise likes of Digital, IBM and HP. If analysts predictions are accurate, Compaq will be an \$18 billion company in their next fiscal year. That's up from \$15 billion in 1995.

Compaq has indeed grown — not only in size, but in its stature as a manufacturer of PC or so-called industry-standard servers (read Intel x86). "We've been extremely successful in the server business the last couple of years," says John T. Rose, Compaq's senior vice president and general manager, Enterprise Computing Group. Rose figures that Compaq has now sold more than 1 million of its servers. "No one in the [PC] industry can make that kind of claim," he boasts. Independent market research supports Rose. IDC (Framingham, Mass.) pegs Compaq's

worldwide server share at 31 percent. And although HP's server market share grew 22 percent in the third quarter of last year, HP is still in second place with only a 12 percent share.

There's no doubt about it, Compaq has gotten itself organized. In June 1996, in a sweeping reorganization, three new product groups were created: the Desktop PC Group, the Enterprise Computing Group and the Consumer Products Group. Rose is responsible for the Enterprise Computing Group, which includes workstations and servers, as well as networking and Internet products. Call it a reaction to market conditions: "We are seeing many customers, that have been [previously using] UNIX/RISC systems, now using the client-server model with the x86 architecture. That's happening in vertical market segments, database applications and we are starting to see it in high availability systems," says Rose.

Yes, Compaq is expanding into a market where prices and profit margins have traditionally been much higher. So, many might suspect Compaq will abandon the price-sensitive low end.

Not if Rose can help it. He points out that Compaq's ProSignia server is 20 percent below the mail order Dell Computer in North America. In the area of systems management, a sticking point for most IT managers, Compaq introduced an HP OpenView-compliant ver-

Analysts expect the NT/x86 workstation market to grow by more than 40 percent through the year 2000.

sion of its Insight Manager (\$4,999), a systems management tool which ships with all Compaq's servers. "There are 850 agents that HP OpenView can recognize," says Rose of the OpenView product.

With an established goal of becoming one of the top three global computer companies by the year 2000, Compaq introduced the first five models of the Compaq Professional Workstation this past October, thereby sending a shot across the bow of RISC/UNIX workstation vendors. Compaq has targeted three areas where a transition to an Intel/Windows

(Continued on page 19)

Staking Their Claim

Barclay's Global Investors Manages Production Systems With AutoSys

In 1993, Barclay's Global Investors (BGI), a world leader in structured investment management, decided to migrate from its proprietary Prime computer system to UNIX. After an extensive evaluation, Barclays selected HP. At the same time, BGI decided to automate and improve its background processing and job management. Because the company operates in earthquake-prone California, IS management needed to create a backup procedure to ensure that, if San Francisco experienced an outage, production would continue, and neither the traders nor the operations staff would be adversely affected.

ROCKIN' ROUND-THE-CLOCK

To ensure that it could maintain 24x7 production, Barclays established a primary environment in Sacramento, as well as a shadow environment in San Francisco. The company runs HP-UX 9000 K400s deployed as database servers and E45s for communication and event processing. For processing loan transactions, BGI runs software called Loanet in Salem, N.H. on an HP 3270 SNA emulator. The San Francisco datacenter mirrors Sacramento in both hardware and applications. This scenario enables local traders and back office staff, as well as

corporate staff at BGI's parent company in London, to connect to Sacramento in case of an outage in San Francisco.

Most of the data used to track BGI investment positions as well as worldwide loans is stored in a Sybase RDBMS with its data replicated in Sacramento. The company employs more than 1,200 people globally who contributed to creating \$43 billion in new assets through August 31, 1996. In addition, BGI is actively transitioning from its legacy systems to a client-server environment.

The company is developing a number of proprietary applications in PowerBuilder, with five

separate PowerBuilder applications currently running 175 executables on UNIX. Philip Grillo, a principal in Securities Lending Systems which is a part of the Capital Market Systems (CMS), and his group also are using Windows NT 4.0, having started with NT 3.5.1 then participating in the NT 4.0 Beta. All new development is done using PowerBuilder 5.0, HP database servers running Sybase System 11, and Windows NT 4.0 on the desktop.

ALL THROUGH THE NIGHT

In the process of porting and migrating applications, Sam Aruti, manager of Global Systems Support, and his team decided to attack CMS scheduling issues. CMS is a part of the Information Systems Group, which also includes portfolio management, trading opportunities, equity trading and data, by first evaluating cron and then looking at all leading scheduling tools for UNIX. BGI wanted a system that would automate the nightstream process being handled by three operators on two day shifts and two operators on the graveyard shift. "We wanted reliability and scalability in whatever product we chose," says Aruti, whose responsibilities encompass BGI's



infrastructure management worldwide. "Having 100 percent assurance that our jobs would be done on time and that we would have a system available to handle all our scheduling needs was our first priority."

DAY AFTER DAY

On a typical day, BGI receives files from "global custodians" ranging from Morgan Stanley Trust Company and Brown Brothers Harriman to Boston Safe Deposit and Trust. These custodians notify BGI as to what the company can lend that day, and send files indicating what transactions have settled. For example, if a client of Brown Brothers has 2 million shares of HP stock that BGI can lend, Brown Brothers sends BGI the available inventory for the client. BGI provides a view of the inventory for the brokers, who will negotiate the number of shares, the price, the rebate rate, the collateral to be pledged and the duration of the loan.

With multiple operators on multiple machines, the opportunities for errors occurred more often than Securities Lending could tolerate. "We process more than 200 jobs in Securities Lending alone," says Grillo. Grillo is responsible for both the development of proprietary new applications as well as the day-to-day support of the securities lending production environment. "Because all of our jobs are dependent on one another, and because we are transmitting critical and sensitive information, we need all data to be received and processed in a timely manner," he concluded.

Aruti's team selected Platinum Technology's (Oakbrook Terrace, Ill.) AutoSys to manage its nightstream operations. AutoSys is a sophisticated job management system for distributed environments. According to both Aruti and Grillo, AutoSys provides the flexibility, reliability and control they require to manage production systems.

Pricing for Securities Lending is another critical aspect of Grillo's charter. His group cannot conduct business without current pricing. "We have a data group that pulls prices from a

number of vendors," says Grillo. Securities Lending has a job in AutoSys that extracts a list of BGI's assets, sends that list to the machine that processes prices, creating a list of assets BGI needs to price. Another system adds prices to the securities and returns them.

"Each night, we look at 12,000 to 18,000 assets. We wait for the return file, then update our database with prices. Without this pricing info, we could not value outstanding loans, know how much collateral to hold against those loans or know the price new loans are at each day. We would be blind," says Grillo. His team also uses TelAlert from Telamon (Oakland, Calif.) to provide paging functions. If a job fails, for example, an operator can be paged. If the pricing box in AutoSys has not started as scheduled at 3:00 a.m., Grillo receives a page. Likewise, if it hasn't finished at 4:00 a.m., he is paged again.

SAVING TIME AND MONEY

There were several mornings, during the Prime and manual system days, when the pricing information was not received. Someone in Applications Support would be paged and have to determine where the breakdown occurred. Fixing the problem could take from 15 minutes to 1.5 hours. While that was being done, business users were waiting — and brokers would be upset because they could not work. "With AutoSys, we wait for the file and if the process breaks down by 3 o'clock on the way out or 4 o'clock on the way in, we can be proactive," Grillo commented. "We know if a problem exists an hour before our users come in," he remarks.

Additionally, AutoSys has a job that sends a message to all interested parties letting them know that a job is processing; they also receive a message when a job has completed.

— *Marti Colwell is a contributing author. She can be reached at: marti@mktg.win.net.*

Compaq Climbs

(cont. from page 17)

NT platform is most likely: mechanical computer aided design (MCAD), financial information and analysis, and interactive content and software development. Not unlike HP, Compaq has also partnered with several key vendors like Autodesk, Bentley, Reuters and Adobe to help them achieve their goals. It makes sense; analysts expect the NT/x86 workstation market to grow by more than 40 percent through the year 2000.

Rose says Compaq is closing the gap on expensive proprietary solutions. "The promise of UNIX/RISC has never been fulfilled. It's not open; never has been. And business cycles are changing much faster than the systems' ability to keep pace." Rose also recognizes that global players need to provide not only great products but provide great service and support. "We are expanding that" he explains, "through acquisition and investment in more professional services people. We'll have more Compaq branded service offerings, a key part of the solution."

In 1985, three years after it was founded, Compaq joined the Fortune 500. Since then, Compaq has only looked back once. In 1992, after a period of declining profits, shrinking market share and questionable strategy, Rod Canion, one of Compaq's founders, was ousted. But Compaq now has an "anti-not-invented here" syndrome as Rose calls it. "We don't have our own OS or our own chip architecture, and we don't have a legacy or UNIX platform. We don't have any religious things. Traditional computer companies like HP have business models that are being challenged. We are cost-oriented, with a cost consciousness in our entire design. We challenge ourselves by challenging what made us successful."

— *George A. Thompson, Senior Editor*

The Lonely Life Of A Network Administrator

Cable Systems Picks MTI RAID To Guarantee Uptime

Each week, Cable Systems International (CSI; Phoenix, Ariz.) uses more than 1.7 million pounds of raw copper taken from Arizona mines and turns it into enough copper wire to stretch from here to the moon.

Operating five days a week, 24 hours per day, more than 1,800 employees work to supply the copper wire needs of such global super companies as the Regional Bell Operating Companies (RBOCs), GTE, Lucent and many others. When the company suffered a series of catastrophic disk drive failures in early 1996, it put a hole in the company's financial data and took more than 153 hours to get the system, and the company, back in production.

With unscheduled downtime costing an estimated \$40,000 per hour, the company decided last April to take steps to make sure it never happened again. After a competitive review, CSI turned to MTI Technology Corp. (Anaheim, Calif.) to solve their fault tolerant and performance needs. Impressed with the 40 patents obtained by MTI in the areas of RAID, fault tolerant and networking technologies, CSI executives say they felt MTI had a deeper understanding of RAID technologies than other vendors.

CSI selected six separate MTI 9300 RAID Level 5 Arrays each containing seven 4.29GB drives for a total of 180GB. Each array subsystem is configured with an online hot spare disk drive. The six-array subsystems are chan-

neled to an HP T500 platform through two SCSI controllers.

According to CSI's own benchmark tests, the MTI 9300 RAID Arrays outperformed their old solution by more than 700 percent while still providing complete fault tolerance.



CSI selected six separate MTI 9300 RAID Level 5 Arrays each containing seven 4.29GB drives for a total of 180GB.

The task of conducting the review had fallen to Rob Bartlett, CSI's network administrator. He had been asked to select the right storage solution to ensure the 98.5 percent uptime required by CSI's opera-

tion. When all was said and done, he had solved the problem so well with the MTI 9300 RAID Arrays, that he is now affectionately known by colleagues as Maytag, short for the Maytag Repairman, the television icon who sits around all day with nothing to do because his washing machines never break down.

How did he earn such a moniker? Well, it wasn't easy. The entire company — manufacturing, finance, operations, sales — is run on an SAP R/3 system tightly coupled to an Oracle 7 database. The platform has a three-way HP T500 running HP-UX 9.04 with 100GB RAID Level 1 subsystems providing 50GB of usable capacity. The network stretched across 120 acres and more than 1.3 million square feet of buildings, an area equivalent to about 25 football fields.

Bartlett says he was experienced with RAID Level 5, but was unclear as to which vendor now presented the most cost-effective solution, especially because he also had a performance problem. The average response time had slid to an uncomfortable three to five seconds. Now, he needed to make sure he had fail-safe redundancy and improved performance. Armed with a budget of \$350,000, he invited the leading manufacturers to propose solutions to solve the problems.

"I was charged with making sure that we never experienced

complete failure again," Bartlett says. His request for proposal specified fault tolerance, redundancy, hot swapability and RAID Level 5. "We didn't specify performance as an issue because we were not expecting the drives to do any better than the drives we had," Bartlett says. "In fact, we expected a decrease because of the inherent overhead of RAID Level 5." Bartlett says he expected to solve the performance problem by adding additional CPUs and memory to the platform.

"All of the research I did indicated that we needed three more CPUs and another 256MB main memory to get the response time down to 1.5 seconds," says Bartlett, explaining he had the added challenge of solving both problems within the confines of the \$350,000 budget. The contenders for CSI's business included CLARiiON Arrays, Digital Storage Works, EMC Symmetrix and the MTI 9300 RAID Array.

THE BUDGET TEST

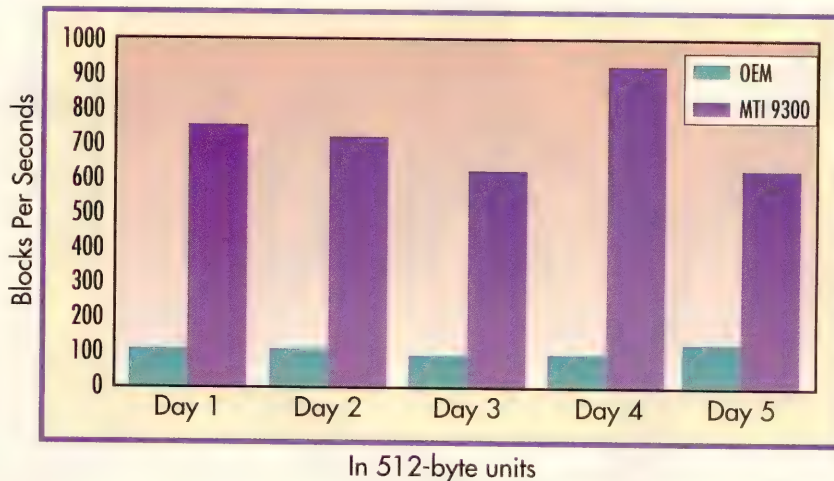
"One vendor says their drives would fix all our problems," Bartlett says. "Just hook up their drives and all our worries would go away. It would even solve the performance problems at the box. They also were sure they would fix the three to five second response time with just the drives," Bartlett says. "But to purchase their drives would have required me to spend the entire \$350,000 and then bet the whole farm on their drives."

He says he wasn't convinced the performance problem could be fixed with just new storage. What attracted him to the MTI 9300 RAID Array? "All things being equal, I decided to go with the people who seem to really know RAID," says Bartlett.

Bartlett says he knew EMC signed a five-year, \$40 million agreement in February to acquire a 29-patent portfolio from MTI in the areas of RAID,

fault tolerance and networking technologies. Bartlett says he understood why EMC had been impressed with many of MTI's RAID technologies. What Bartlett says he admires most is MTI's mirrored, write-back cache and cache management/optimization techniques.

"I worked with RAID Level 5 for a number of years and I think MTI's approach is the most logical," says Bartlett, explaining that MTI eliminated much of the performance problem



of RAID Level 5. "Rather than throwing more hardware at it, they seem to understand RAID at a deeper level than other vendors. It was simply the best technical solution."

He put in an order for six MTI 9300 RAID Arrays totaling 180GB. The arrays use factory integrated 4.29GB SCA disk drive canisters. According to Kevin J. Liebl, MTI vice president of marketing, MTI is pleased to be able to offer companies such as CSI a new generation of fault-tolerant storage solutions for the UNIX market. The systems were designed from the ground up to offer the highest availability and the highest performance in the industry.

"Often times high availability comes at a cost in both performance and price. With the 9300 RAID Storage Array, users no longer have to compromise," says Liebl.

BENCHMARKS

According to benchmark tests conducted by Bartlett, the MTI solution out-

performed the old system in the areas of bytes transferred per second, read/writes per second, and in rotational latency. "In July, when the MTI arrays were configured and running on our database server, overall performance went from 1.5 seconds to 1.2 seconds," Bartlett says. Specifically, seek time went from 1.5 seconds to .75 on the three-tier back-end database server, and from 1.5 to 1.24 on the three-tiered application servers. "We have redundant controllers, redundant

power supplies and hot online spares on each array. That means we can lose up to two drives on each array and still operate," says Bartlett.

Farid Neema, president of Peripheral Concepts Inc. (Santa Barbara, Calif.), says Bartlett was correct to conduct his own benchmarks. "With the 9300 model,

MTI has joined the upper class of RAID products in terms of fault tolerance," says Neema. "Because there is often a big difference in price among solutions, and because industry benchmarks seldom reflect the user application, users like Bartlett are well advised to run their own tests prior to making the final choice."

Bartlett has ordered 11 more storage systems, including five 9500 RAID Arrays for the company's Novell NetWare server. "I've never been a very lucky person, that's why I like RAID Level 5," Bartlett says. "And the nice thing about the MTI arrays is that I don't even know they are there."

MTI integrates distributed data management software, a hierarchy of modular storage, and offers services and support from more than 40 offices in the United States, Canada and Europe.

MTI may be reached at (800) 999-9MTI, info@mti.com or www.mti.com. ■

HP Raises the ANTE

T i m P a r k e r

Editor's Note: For the past several years, HP's PA-RISC/HP-UX servers have been one of IS' favorite choices for enterprise servers. In 1996, HP continued to make improvements in its HP 9000 product line to keep it that way. For example, HP's entire product line is now based on the 64-bit PA-8000 CPU. To help you understand all the options, we offer the following overview.

Having left behind the Series 800 label for its HP 9000 servers last year, HP's 9000 "Business and Technical Servers" systems now use the "alphabet-designation" and are comprised of the D-, K- Enterprise Parallel Servers (EPS) and Scalable Parallel Processor (SPP) servers. HP's D- and K-class UNIX servers were introduced in January 1996 and quickly upgraded with the PA-8000 in July. The D-class servers, (see At Press, page 24, for latest D-models) replacing the E-class servers as the entry point of the product line, were designed to go head-to-head with Compaq Computer's ProLiant servers, its Intel-based multiprocessing systems. However, the PA-RISC CPUs (either 75 or 120MHz versions of the PA-7200, or 160MHz PA-8000) used in

the D-class servers are inherently faster than the Intel Pentium CPUs used in the Compaq servers. But because benchmark suites differ, actual comparisons between the two machines are difficult to determine.

Nevertheless, the D-class Enterprise Server takes a respectable place in the lower-priced server market for small workgroups or companies new into client-server computing. The D-class machines are notable for their upgradability, which tends to permit quick field upgrades of most components and their two-way symmetric multiprocessing (SMP) ability. With a 1.5GB maximum of RAM, the D-class machines can also be used as a Web server. Performance of the D-class PA-8000 depends on which of the many CPU and SMP configurations are chosen, but the single CPU PA-8000 model

D270 offers 10.4 SPECint95 and 15.0 SPECfp95; very respectable numbers when compared with the older PA-7000 series machines and almost on a par with the more flexible new K-class servers (see Figure 1).

The HP 9000 K-class Enterprise Server, HP's next step up in the HP 9000 product line, can be used as the core for a mid-size enterprise operation. As with the D-class machines, CPU upgradability and expansion are part of the basic design. This represents a welcome design philosophy from HP and should be continued in all future lines.

The K-class series supports from one to four processors. The CPUs of the K-class server can be PA-7200 or PA-8000 series chips, in a variety of speeds. The fastest model, the K460 offers 180MHz PA-8000 CPUs and up to

4GB RAM, almost a 10 times performance improvement over the slowest model in the K-class lineup. To support the high CPU performance, the K-class servers use the new HP 960Mbps processor-memory bus, a 288Mbps multi-channel I/O subsystem and SCSI-2 disk channels. Performance figures show the power of the K-class system. The K460 offers a single-CPU SPECint95 of 11.8 and a SPECfp95 of 20.2 (see Figure 2, page 26).

HP hasn't ignored its HP 9000 Enterprise Parallel Server (EPS) series. Introduced in May 1996, the EPS21 and EPS30 use scalable SMP systems tied together into parallel architectures. Unlike alternative parallel architectures that utilize loosely coupled uniprocessor nodes,

the parallel architecture of the HP 9000 EPS21 and EPS30 uses high-performance SMP technology as scalable building blocks, thereby exploiting the strengths and capabilities of multiple tightly coupled CPUs within the SMP infrastructure. Additional SMP modules can be added, when required, to increase parallelism or to potentially scale up overall performance, capacity, I/O bandwidth, or system resources such as memory and disk.

The EPS21 offers four-way SMP per side with up to 64 processors total. Future expansion capabilities will allow an EPS21 to grow to 256 processors with an optional 266 Mbps high-speed Fibre Channel Enterprise Switch. The EPS21 is the first open enterprise product from HP to feature Fibre Channel, which promotes parallelism by providing low-latency, high-bandwidth links

between server nodes. The EPS30 allows 14-way SMP per side with 224 processors now (with a Fibre Channel Enterprise Switch interconnect) and future scalability to 768 processors. Currently the processors can be PA-7200 or PA-8000 series CPUs.

In March 1996, the SPP1600 was introduced. Available in two models — the SPP1600/CD and the SPP1600/XA — applications can make use of shared memory or explicit message passing (EMP) parallelization or a combination of both. The SPP1600/CD uses up to 16 PA-7200 processors, providing up to 3.8 GFLOPS peak performance and 4GB of physical memory. The SPP1600/XA features up to 64 processors, delivering performance levels as high as 15 GFLOPS with up to 16GB of total memory.

The introduction of HP-UX 10.20 this past September added a number of features to the OS that will be useful on servers, although there seems to be a reluctance to upgrade in many large corporations where 9.x has been in use for several years. Redesigned from the kernel up, HP-UX 10.20 adds better scalability (and up to 14-way SMP) to the OS, especially useful for larger servers like the K-class and EPS series.

HP-UX 10.20 includes several features that support 64-bit processor systems like large-file support — up to 128GB and a Journaling File System (JFS), a Logical Volume Manager (LVM) and high-availability. In addition to increased file size support, HP-UX 10.20 also includes advanced compiler functionality, fast procedure calls,

virtual memory mapping and large-page capabilities.

EXEMPLAR D-, K-, S- AND X-CLASS

Not to be confused with HP's commercial UNIX servers, HP's Exemplar series (acquired in HP's acquisition of Convex Computer in 1995) addresses the availability of high-performance applications across all disciplines through global shared memory.

Industry applications for these systems include mechanical design, electronic design, oil and gas explorations and scientific research.

The Exemplar D- and K-class systems range, like their commercial relatives, from one to four CPUs. As engineering workgroup servers, the D- and the K-class systems are ideally suited to offload computationally-intense applications from workstations. They deliver a floating point performance — a SPECfp of 20.2 — that's adequate for engineering and analysis applications.

The S- and X-class systems use a memory crossbar similar to traditional supercomputer memory subsystems. The memory crossbar delivers high-bandwidth, low-latency, non-blocking access from CPUs and I/O channels to local memory. The S-Class system ranges from four to 16 CPUs. With 15.3 GBps system bandwidth.

The X-class system is the world's fastest scalable parallel supercomputer. Ranging from 16 to 64 CPUs, it delivers up to 46 GFLOPS performance.

D-class and K-class File Server Comparison				
Server	Throughput	Connectivity	Additional connectivity via switch	Number of users
D-class	TBD	10BaseT (Ethernet), FDDI, ATM, FiberChannel	100BaseT	20-300
K-class	up to 9572 IOPS	(Ethernet), FDDI, ATM, FiberChannel	100BaseT	100-1000

Figure 1. D-K Comparisons

Source: Hewlett-Packard

HP Raises the Ante

The system is based on a CC-NUMA (Cache Coherent Non-Uniform Memory Access) architecture — the fourth generation of consistent architecture.

CAPACITY IS THE NAME OF THE GAME IN SUBSYSTEMS

There has been intense activity on many of the support peripheral areas for servers in the last year, and one of

the hottest markets has been storage.

DAT tape drives, perennially a favorite of sys admins, have been under pressure from several new technologies. HP has been backing the Digital Linear Tape (DLT) system for servers and workstations due to its 40GB compressed capacity (20GB uncompressed). The transfer rate is 10GBph, which is not exceptionally fast compared to some storage approaches but outstrips DAT and many other technologies. The DLT system's capacity has been

winning friends as it can replace entire tape libraries or autotape DAT units with a single tape drive, as well as being competitively priced.

DLT has a few features which make it more attractive than competitive technologies in the same price range, including the ability to find any file on a tape cartridge in about 45 seconds (thanks to a high-speed streaming search function and a file mark directory written to the end of the data stream). For example, the DLT tech-

AT PRESS: HP'S NEW HP 9000 D-CLASS ENTRY-LEVEL ENTERPRISE SERVERS

This past January HP introduced two new package options for the HP 9000 D-class Enterprise Servers. The new D-class Enterprise Servers, Models D330, D320, D230 and D220, are powered by 160MHz and 132MHz versions of HP's PA-7300LC processor. According to HP, these uniprocessor servers provide up to 50 percent price/performance improvement over their D-class predecessors.

Priced under \$8,900, the new HP 9000 Model D220 establishes an entry-level price point into the new set of PA-7300LC-based D-class servers. The Model D220 features the following:

- 132MHz PA-7300LC PA-RISC processor with 128KB primary cache.
- Optional 1MB secondary cache upgrade.
- Expansion upgrades, including in-box upgrades to 64-bit PA-8000 based D-class servers.

The new HP 9000 Model D330 price begins under \$16,700 and features the following:

- 160MHz PA-7300LC PA-RISC processor.
- Standard 128KB primary and 1MB secondary cache.
- 500 SPECweb96 Internet performance.
- Standard hot-swap disks.

In addition to Internet functions, the new servers target commercial and technical enterprise environments in small to medium-sized businesses, workgroups, small departments and replicated sites. Common applications for these new servers include database- and applications-processing, messaging, workgroup file management and product-data management.

The new servers support maximum configurations of 1GB of memory, 20GB of internal hot-swap disk storage, 5TB of external disk storage, eight expansion slots

and an aggregate I/O bandwidth of 160MBps. They are binary-compatible with all HP 9000 Enterprise Servers. All the new D-class servers are board-upgradeable to the top of the D-class family, the Model D370.

Base configurations and pricing for each of the new servers include one PA-7300LC processor; 128KB of primary cache; 32MB of memory; 2GB of internal disk; SCSI-2 interface; CD-ROM drive; two additional media bays; 802.3 EtherTwist LAN interface; a client/server HP-UX 10.20 license; and a three-year, next-day, on-site warranty.

Some additional features include the following:

- HP 9000 Model D330 — one 160MHz PA-7300LC processor, 1MB secondary cache, eight-I/O-slot package, five F/W hot-swap disk bays. Priced under \$16,700.
- HP 9000 Model D320 — one 132MHz PA-7300LC processor, eight-I/O-slot package, five F/W hot-swap disk bays. Priced at \$13,900.
- HP 9000 Model D230 — one 160MHz PA-7300LC processor, 1MB secondary cache, five-I/O-slot package, two S/E disk bays. Priced under \$11,700.
- HP 9000 Model D220 — one 132MHz PA-7300LC processor, five-I/O-slot package, two S/E disk bays. Priced under \$8,900.
- HP 9000 Model D210 — same configuration as Model D220, powered by one PA-7100LC processor. Priced under \$6,900.

All four of the new systems are now available. HP also reduced prices on current HP 9000 Models D210 and D310. The D210 and D310 are now priced 20 percent lower at \$6,900.

— Charlie Simpson, Editor-in-Chief

nology offers lower head wear than DAT, because of the design of the tape feed mechanism and low tape tension.

HP rates their DLT4000 tape drive for 10,000 hour head life and 500,000 media passes. Data integrity is assisted with DLT because of a low bit error rate (one in 10^{17} bits). HP has been

positioning the DLT4000 as the ideal backup system for 9000 series workstations and servers. For higher capacity requirements, a tape library unit based on the DLT system was devised with multiple tape drive units and autoloader mechanisms. For the cost, the DLT4000 is attractive and reliable.

For even more capacity, HP offers the Redwood SD-3 Helical Tape Cartridge Subsystem, developed in conjunction with StorageTek. The SD-3 is intended for use with top-end server systems like the T-class series, and offers up to 68Gbp of backup through independent controllers. A

NEW HP PC SERVERS

In early January, HP proved that it can duke it out with Compaq in the price-sensitive PC server segment by introducing the HP NetServer LD Pro system, a 180MHz Intel Pentium Pro-based server (board-upgradable to dual Pentium Pro) for departmental workgroups. The HP NetServer LD Pro system Model 1 (\$3,399 approximate street price) with 32MB of Error Checking and Correcting (ECC) RAM (up to 512MB possible), hot-swap disk drives, and up to 27GB hot-swap and 8GB of non hot-swap storage capacity, includes three available PCI and two EISA slots for expansion. For network connectivity, the LD Pro also includes the HP DeskDirect 10/100 TX PCI LAN adapter featuring high throughput and low CPU utilization and comes with a complete set of 10Mbps and 100Mbps drivers for major network operating systems. Below is an overview of HP's entire NetServer product line includes the LD Pro.

Target Market	Small Business Workgroup	Corporate Workgroup	Corporate Departmental	Corporate Enterprise
HP NetServer	E 30 5/133 M1 5/166 M2100	LD Pro 6/180 M1 6/180 M2100	LH Plus 5/166 M1; 5/166 SMP M1 Array LH Pro 6/200 M1; 6/200 SMP M1 Array	LxE Pro 166 M1; 6/200 M1 Array Lx Pro 6/166 M1; 6/200 SMP M1 Array
CPU	133 or 166MHz Pentium	180MHz Pentium Pro (upgradeable to 200MHz SMP)	512MB (256KB integrated with Pentium)	166 or 200MHz Pentium, uni-quad SMP
Cache (write-back)	256KB	256KB (integrated in CPU)	512MB ECC (LH Plus); 1GB ECC (LH Pro)	512KB (integrated with CPU)
Maximum RAM	192MB ECC	512MB ECC	Dual integrated UltraSCSI	2GB ECC
I/O Slots	Fast SCSI-2 controller	Integrated UltraSCSI	4 PCI, 1 shared PCI/EISA and 4 EISA bus master	dual integrated UltraSCSI
SCSI Controller	2 PCI, 2 shared PCI/EISA and 2 EISA bus master slots	4 PCI and 2 EISA bus master slots	6 hot-swap; 1 non hot-swap	6 PCI and 4 EISA bus master
Drive Bays	4 non-hot swap	2 hot-swap; 2 non hot-swap	54.6GB hot-swap	6 hot-swap, 3 non-hot-swap (LxE Pro) 12 hot-swap, 3 non-hot-swap (LX Pro)
Maximum Storage	14.6GB	27.3GB hot swap	Optional	109.2GB (hot swap)
Power Supply	No	No	NetServer	Optional (Lxe Pro); Standard (LX Pro)
Server/Remote Mgmt.	NetServer AutoPilot/ No	NetServer Navigator/ NetServer Remote Assistant (optional)	Navigator/ NetServer Remote Assistant (optional)	NetServer Navigator/ NetServer Remote Assistant (optional)
Price (estimated street)	\$1,646 (5/33 M1) \$2,201 (5/166 M2100)	\$3,421 (6/180 M1) \$4,231 (6/180 M2100)	\$5,219 (5/166 M1); \$8,009 (5/166 SMP M1 Array) \$5,805 (6/200 M1); \$9,418 (6/200 SMP M1 Array)	\$10,009 (6/166 M1); \$13,647 (6/200 Array) \$12,648 (6/166 M1); \$36,390 (6/200 SMP M1 Array)

HP Raises the Ante

physically imposing unit, the SD-3 is the world's fastest tape subsystem, with up to 50TB of storage when configured with the Wolf-Creek library unit with automated retrieval. This type of backup system is far beyond most server requirements. But for a few, it offers unparalleled backup and data security.

Disk arrays have not been ignored, either. A number of companies have introduced subsystem disk arrays compatible with HP servers, including HP themselves. The Model 10 and Model 20 High Availability Disk Arrays offer up to 42GB or 84-GB Fast and Wide SCSI drive subsystems in the Model 10 and Model 20 respectively. With built-

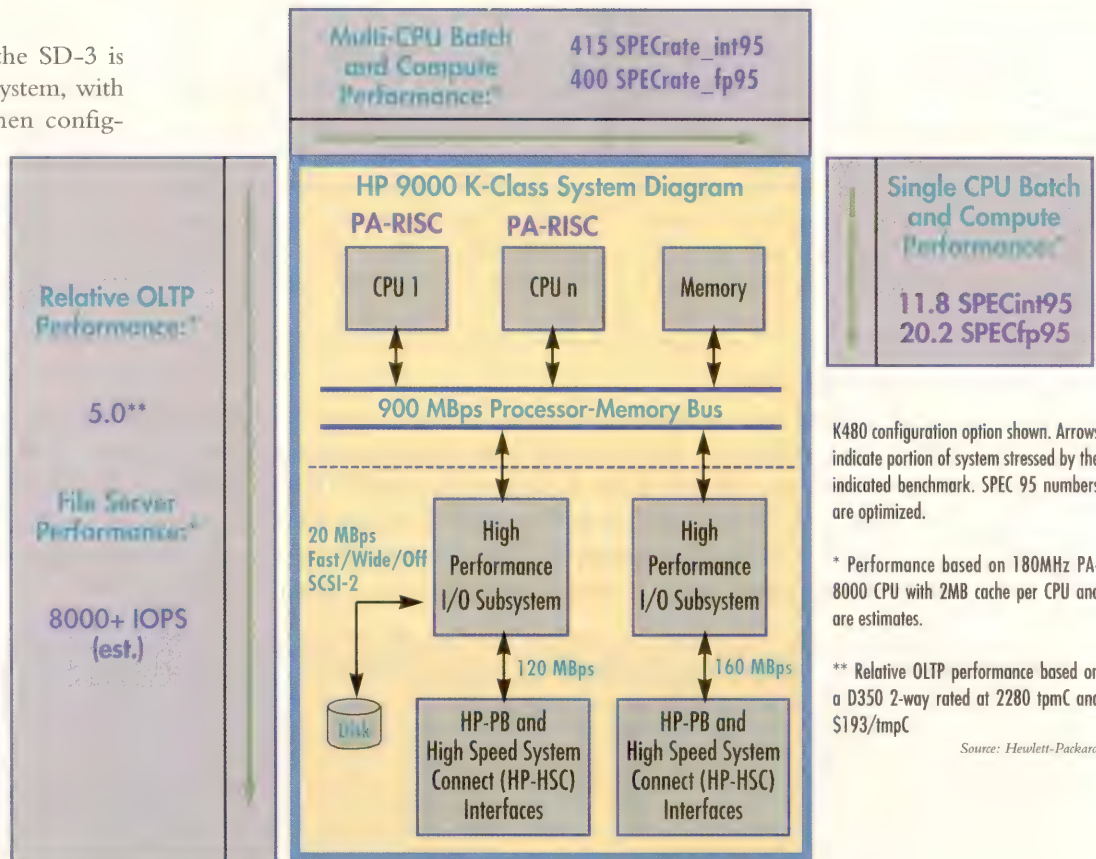


Figure 2. CPU Performance

K480 configuration option shown. Arrows indicate portion of system stressed by the indicated benchmark. SPEC 95 numbers are optimized.

* Performance based on 180MHz PA-8000 CPU with 2MB cache per CPU and are estimates.

** Relative OLTP performance based on a D350 2-way rated at 2280 tpmC and S193/tmpC

Source: Hewlett-Packard

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in support for RAID 1 or 5 and automatic failover of controllers in case of problems. Both disk array models can be configured with multiple RAM cache options up to 16MB (model 10) or 64MB (Model 20) for faster throughput.

NETWORKING GETS INTO THE INTERNET

HP has always provided networking solutions, and the introduction of Internet Services/9000 offers more flexibility for customers. Internet Services (formerly known as ARPA

trolled by Praesidium. There is a lot of flexibility in the software, allowing control not just of straight access permissions but also for time limits and other conditions, all based on rules the administrator defines. Praesidium offers a different approach to security on an HP-based network that also includes non-DCE environments.

IT'S IN THE CARDS

Although there may be a new series in the works for this year, the introductions of the K- and D-class machines should keep the HP SMP server market competitive. As you might expect, HP will be introducing new server models in the next year which use the PA-8000 CPUs at faster and faster processing speeds. For example, at the high-end of the HP 9000

Server line, HP announced a new PA-8000-based T-class system — the Model T600 — which supports up to 12-way SMP processing and offers customers a cost-effective, mainframe-alternative platform. The Model T600 supports up to 3.75GB of memory, with future growth of up to 16GB; a combination of up to 168 HP-PB or up to 24 high-speed HSC slots; and up to 30TB of disk storage. The new PA-8000-based HP 9000 Model T600 server is scheduled to be available in the second quarter of 1997.

The server's expandability and upgradability allows HP to position a server for practically any size of market and requirement. With high-speed, high-capacity peripherals now available, the server market is becoming much less exciting from a technology perspective, but it offers more reliable, robust and powerful systems.

—Tim Parker is the author of TCP/IP Unleashed, published by Sams. He can be reached at tparker@tpci.com. George A. Thompson, Senior Editor, contributed to this article. He can be reached at thompsonga@cardinal.com.

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The introduction of Internet Services/9000 offers more networking flexibility.

Services) offers TCP/IP intranet and Internet services for Series 9000 machines. (See Industry Watch, page 8, for HP's/Cisco networking partnership announcement).

Included with the system is the usual alphabet soup of protocols and add-ons for TCP/IP, as well as the most commonly used other Internet services. Internet Services/9000 can be coupled with any type of hardware currently supported by HP servers, including X.25.

It's hard to discuss the Internet or intranets without touching on security, and HP has a software solution for you. HP Praesidium is a rules-based server package intended to offer Internet or intranet access control through a number of approaches, all controlled through straightforward GUI applications. Praesidium can be used as an authorization server not only for access from outside the network, but also for applications which need to control access to network components. Praesidium lets administrators set up profiles that define which privileges users can be granted. And, all network users are assigned to one or more profiles, depending on their requirements. From there on, their access is con-

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HP 3000:

◆ By Charlie Simpson ◆

The HP 3000 is all grown up. Or is it? People still believe in the HP 3000 for the same reasons they did a quarter of a century ago. That's not a foolish consistency. HP divides the HP 3000 customer base into three groups, and are therefore addressing three strategies for its customers. The first group are users who remain with the HP 3000, but are growing their applications.

The second group consists of those with a "supplemental mindset." These users rely on the HP 3000 for critical applications and data. However, they need to take advantage of new technologies that are available on other platforms, namely HP-UX and Windows NT. These users implement specific applications on HP-UX or Windows NT in the enterprise, but then need to integrate them back in with the HP 3000.

HP estimates that about 80 percent of its users fall equally into each of these two categories. With another 10 percent classified as users who are migrating away from the HP 3000 and implementing new platforms, and 10 percent doing nothing at this time.

The group migrating away is almost completely motivated by application requirements. In other words, the customer finds an application that is critical to their business, but it is not available on the HP 3000. Not surprisingly HP-UX is the most common platform to which this group migrates.

WHO ARE YOU? WHO? WHO?

HP addresses the first group in two areas — vertical and horizontal. Vertical growth is simply users expanding on



As the HP 3000 celebrates its 25th anniversary, HP put on its fifth annual HP 3000 Strategic Directions conference on January 29. Although there are no new products to announce, there are a few strategies that HP 3000 users will appreciate. HP Professional discussed them with David Greene, communications manager, HP Computer Systems Division.

what HP terms "traditional values" or why the customer bought the systems in the first place — availability and reliability. Horizontal growth occurs as the customers attempt to take advantage of emerging technologies, such as Internet access.

Vertical growth for the HP 3000 covers both software and hardware, including the PA-8000 processor in the large corporate Business Servers this summer. A preview of this technology was seen this past November when the HP 3000's R&D staff introduced the PA-8000 processor on the 979KS servers. In late 1997, users should see the PA-8200 processor in the midrange systems. And finally, the PA-8500 should be in place as the foundation for the HP 3000 in 1999. As far as software enhancements, HP predicts a release of MPE 6.0 at the end of 1997, which will address performance issues, cache management and high performance memory. One way it hopes to satisfy HP 3000 customer needs to remain current is through Express Releases of MPE/iX between the major OS upgrades. This spring, for example, release 5.2 contains Java and ODBC software enhancements.

Delivering the technologies is another issue. According to Greene, customers' horizontal growth or their processing speed needs are growing faster than what HP is projected to deliver. Quest Software's (Newport Beach) Shareplex/iX offers a solution by clustering HP 3000s, allowing some applications to run on the cluster as if it were a single entity. "Theoretically," according to Greene, "you begin to see exponential performance increases."

Back In The Chips

Additionally in 1997, HP plans to announce some advancements in peripherals. In particular in the area of mass storage, a 9GB disk drive and fiber channel as primary connect for high-performance peripherals. In addition, HP will announce support for DLT wrapped together with technology from Legato Systems Inc. (Palo Alto, Calif.) including multiplatform backup.

HP continues its historic commitment to protect application investments. Greene maintains that "if, 25 years ago, you wrote an application for an HP 3000, that same application will run on any of today's systems." To help achieve this level of protection, HP will be announcing enhancements to its COBOL II compiler, to the C++ interface and IMAGE/SQL. As Greene says, "It doesn't make much sense to have a new system, if you don't have a compiler to run your application on it."

IN THE YEAR OF THE YEAR 2000

During the next year, HP 3000 users will be faced with several challenges. The most critical concern will be the year 2000 problem. "We see 1997 as 'The Year Of The Year 2000,'" says Greene. HP has completed a hardware study to ensure that all the HP 3000s in service in the year 2000 will not be affected by the date issue. These software changes will be available with the MPE 6.0 release in December 1997.

HP is working with its key channel partners such as Adager (Sun Valley, Idaho), Bradmark (Houston, Texas) and Robelle (Surrey, British Columbia) who provide tools that ease the elimination of year 2000 issues. But don't wait for New Year's day 1999. Greene advises users to begin evaluating and identifying

the code that needs to be fixed, by "brute force recoding" if necessary or with the help of third-party tools.

A second challenge will be 64-bit computing. The common concern HP 3000 users face is accommodating files larger than 4GB. HP expects to support these files in early 1998 as part of an intermediate release of MPE 6.0. Traditionally, this type of large file support has only been linked with 64-bit computing. However, through recent software fixes, the HP 3000 allows this support in the 32-bit environment, which the vast majority of HP 3000 users have in place.

The third major challenge Greene foresees is the Internet. Overall, HP views the Internet as a key environment as HP 3000 customers jump on secure Web solutions, with such products as SecureWeb Server from Open Market (Cambridge, Mass.) on the HP 3000. The HP 3000 will also be supporting the Java virtual machine and the Java developers kit, and it will be available in late Spring.

The supplemental mindset group is dealing with the data warehouse and data mart phenomenon, where the tools are only available for UNIX or Windows NT; the data remains in the HP 3000. So they face the problems of integration in a multiplatform environment. Greene highlights such desktop projects and products as M.B. Foster's (Chesterville, Ontario) 32-bit ODBC support so Windows 95 and Windows NT clients can pull data from the HP 3000. He expects file sharing between Windows NT and MPE/iX via a free-ware version of Samba (developed by Andrew Tridgell) sometime this year.

In addition to desktop integration, HP is doing some work on server-level integration as well, including standard interfaces and high-speed networking.

For example, database gateways from Oracle (Redwood Shores, Calif.) which was available 1996, and Sybase (Emeryville, Calif.), which is expected to be available in late 1997 allow access to databases on the HP 3000.

In 1997, HP suspects customers will move to Windows NT, although at this point they have seen little actual movement.

DOWN THAT ROAD

Greene points out that, "the reality of the market place is — the strongest growth is on the UNIX side for HP, so its not surprising to see the HP 3000 is no longer the prime focus. And trends in the market don't indicate a change."

Although the size and kinds of industry the HP 3000 can be found in has grown and changed, the HP 3000 user remains the same as those of 25 years ago — "value pragmatic." According to Greene, this user simply wants to get the job done and is not caught up in the "technology wars." "We don't expect a customer to spec-out their own system," concludes Greene. "HP will continue to take responsibility for the technology, once we understand what the customer's business requires."


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When^{the}

CLIENT-SERVER'S NEW ANTHEM



The frustrations of client-server networks have caused many system administrators to throw up their hands and scream, "Never mind!" While they looked forward to achieving the "flexibility, scalability and performance" of a two- or three-tier client-server network (see *Figure*, page 32), system administrators had mind-numbing problems with linking legacy systems to new databases and servers, providing user access at the desktop, getting all the different machines to communicate with one another, and managing all the pieces.

Today, vendors offer software to solve many of the client-server problems, such as centralized management consoles, network mapping tools, distribution and metering software, and fourth-generation languages for building applications that are portable to a variety of platforms. Boston, Mass.-based analyst firm Aberdeen Group reports that only now are the proper tools available to make client-server implementations a reality. And in a 1996 survey by analyst firm Datapro Information Service Group Inc. (Delran, N.J.), 46 percent of the 720

responding companies have implemented client-server applications, up 25 percent from 1995.

But even this 46 percent leaves half of corporate America with their legacy systems, still believing client-server to be unnecessarily complex, and true interoperability between network components to be a fallacy. At the same time, many system administrators are turning their eyes to the promise of the intranet as a way to solve all their network problems. Some industry analysts say that this heralds the end of the era of client-server. But rather than being the end of client-server, intranets and Web-enabled applications could be the technology that takes away the burdens, while enabling the advantages.

STAY WITH THE BASICS?

Essentially, CIOs prefer proprietary systems, although they admit that proprietary systems tend to lock them in to a single vendor.

The main reason for the preference for proprietary systems is that administrators don't want to be bothered with the complex struggles




Kristine Grow

Music's Over

A colorful party horn with a red, yellow, and blue pattern and a purple balloon are positioned to the left of the title.

of interoperability inherent in client-server. One hope has been that an independent standards body would be able to guide the creation of new hardware and software so that all the pieces would be interoperable. But while several such bodies have been created, their movements tend to be slow, and the standards they create require testing before they can be relied on.

"[System managers] always attempt to standardize to something, but it seems less on specific products than on the interface," says Mitch Kramer, consulting editor for the Patricia Seybold Group (Boston, Mass.), an analyst firm. "There has been a great interest in middleware, such as DCOM and CORBA. The difficulty is that they are both new, and the leading tools don't support them."

A large red balloon is partially visible on the left side of the page.

Instead, administrators have insisted that their favorite vendors provide integration with their major competitors. While they may have met with some initial resistance,

administrators today are finding that the vendors are listening. Aware that its customers require interoperability more than most other capabilities, Lotus Development Corp. (Cambridge, Mass.) has put aside its grudge against Microsoft Exchange, and in version 4.5 of Lotus Notes offers several new integration features for Windows NT. Even arch-rivals Novell and Microsoft are offering integration between NetWare and Windows NT.

But analysts such as Kramer remain skeptical: "Vendors will adhere to single APIs if they won't sacrifice product margin by doing so. The moves ... are to increase their market share rather than moves of altruism."

FLY INTO THE WEB

In recent months, system administrators have been looking to Web-based network design to solve their interoperability and access problems. By providing a single Web-like interface to all network resources, system managers enable users to access all data through one desktop via a simple, easy-to-use GUI. Rather than loading desktops

with different terminal emulators or loading servers with software to retrieve data from different sources, system managers simply put a browser on each desktop. Data is retrieved behind the scenes, usually without the user's even knowing from which database the data is coming.

An August 1996 International Data Corp. (IDC; Framingham, Mass.) study found that 51 percent of respondents have implemented an intranet or have plans to implement one in the next 12 months, up from 39 percent 3 months earlier. In a study of its readers, *HP Professional* found that 59 percent will have an intranet within 12 months.

The good news is that with the Internet, an independent organism controlled by no vendor or governing body, system managers can finally begin implementing truly open standards. Companies are beginning to re-engineer their networks to comply with an intranet-supporting framework, make their data accessible via a Web browser, and create or purchase applications that will offer them the greatest intranet capabilities.

According to William Reedy, vice president of IBM's integrated solution

The Music's Over

marketing software group, this trend has led vendors to introduce server suites.

"The Web is the great equalizer, and the time of competitive advantage is compressed," he says. "The big differentiator on the Web is the level of service. That's why we have server suites — to add value to existing applications. It's no longer about computing; it's about communicating."

The theory behind server suites is that networks get the benefits of a client-server network with the ease of management and support of a single-vendor solution. At first, it would appear that such server suites are a move back to single-vendor shops and more proprietary solutions. But there are still some problems to work out with the new suites, such as flexibility and scalability. And locking the IS shop into a single vendor again is a thought that makes most IS shops uneasy, because they are dependent on the path — and the prices — that the vendor chooses.

NOT ENTIRELY A PIECE OF CAKE

As with client-server computing, some issues will need to be dealt with before we see a large-scale deployment of Web-enabled networks.

To acquire compatibility, applications and software still need to be built to standard APIs. The Open Group, the holding company of the Open Software Foundation (OSF) and X/Open Co. Ltd., was recently named as the independent body to guide further production on the ActiveX API for building Web-enabled applications.

Vendors and customers alike have been hot to jump into Java for Web-centric application development. But analysts at firms like the Aberdeen Group are still skeptical about Java. According to Aberdeen, Java is not very scalable, and Java toolsets are still relatively few and untested.

Another issue intranets must face is security. While firewalls against outside intruders are helpful, they certainly do not provide a complete security solution for all corporate data. System managers also need applications to han-

dle validation of users, authentication of corporate data and user activity, and perhaps encryption of data as it is passed between the server and the local or remote client. Several firewall vendors are beginning to add security features to their products, but in the future, security features may also be found in the applications that bring the data to the Web server.

"Any glue between the Web server and the data will have to offer security features," says Andy Yates, product marketing manager of the client integration division of the Santa Cruz Operation (SCO; Santa Cruz, Calif.). "If there are any security implications, the software should take care of those."

The integrity of the data still needs to be guaranteed. Data warehouses need to be able to store various types of data securely, without dropping pieces in communication.

There is a need for greatly increased bandwidth to the desktop. "The bandwidth to the desktop needs to be at least 100Mbit now," says Rick Fant, director of MCS Interactive, a subgroup of Microsoft Consulting Services, "and in 2 years or more it needs to be close to ATM speeds." But

implementing a new backbone is difficult and expensive, and in many cases the companies don't yet see it as necessary. These companies are still waiting for the killer apps to be introduced and prove themselves. Such applications will likely be integrated communications from voice to video, and video streaming to the desktop for training and updates.

Finally, the management tools must be enhanced, and in this area a lot of work is currently being done. Auto-discovery tools enable IS managers to scope out what exactly is on the network. Management tool vendors are adding enhancements to and integration with existing tools, such as HP OpenView and Microsoft SMS. The introduction of thin clients is moving corporate applications off the client and back onto an applications server, creating a more centralized environment.

YOUR FAVORITE PLAYERS

UNIX has long been seen as the platform synonymous with client-server. But many analyst groups report that UNIX is quickly losing ground to

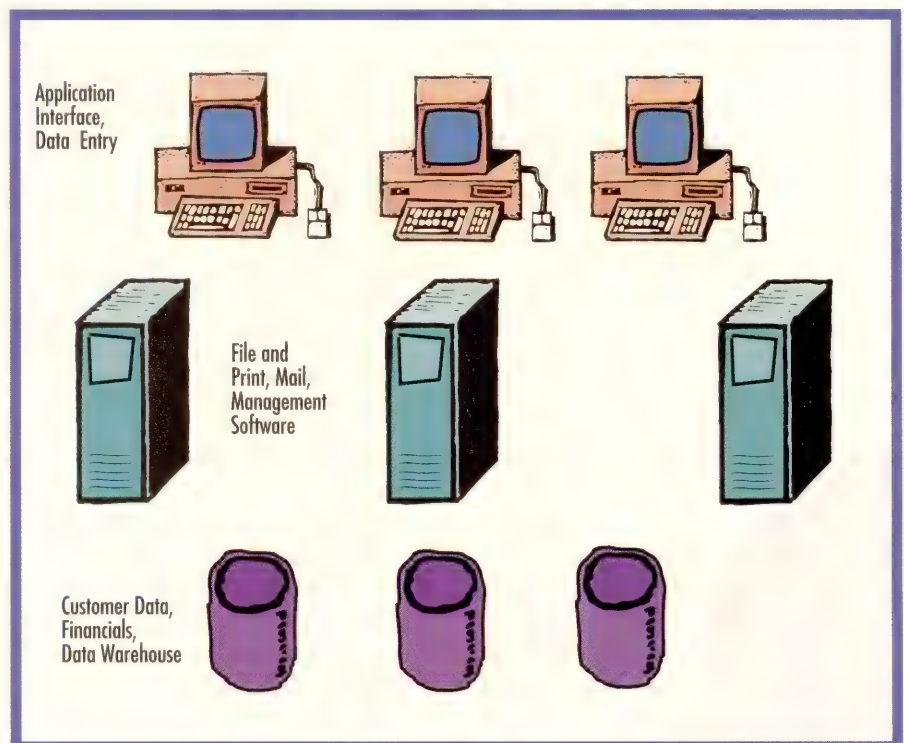


Figure: Typical three-tier client-server networks distribute data and applications among multiple resources in order to increase performance and gain flexibility.

Windows NT. A 1996 survey by Sentry Market Research (Westboro, Mass.) of 700 of the Fortune 1000 companies reported that 49 percent of respondents plan to use Windows NT as their networking and client system, and 44 percent will use it as their Web application server. Only 48 percent said they will use UNIX as their main operating system, down from 74 percent last year.

But UNIX will not be phased out any time soon. UNIX still has better scalability and reliability than Windows NT. And if a shop is unified on UNIX for its data, it cannot be expected to move off very quickly.

"Where UNIX is and where NT is depends on the heritage and the size of the company," says Russ McBrien, worldwide program manager for Intel and UNIX integration with HP's Professional Services Organization (PSO). "If it's a smaller firm, they won't invest in a complex environment

with lots of standards simultaneously. The smaller companies fall into Novell for file and print, and Novell continues to invest and go forward."

Instead, shops are looking at alternate operating systems for their application servers, which require more speed and better interfaces for interacting with users. The choices include NetWare and Windows NT.

Trend-watchers see the evolution of networks into Web-based environments as a move away from client-server and a shift back to dumb terminals accessing host machines. Many see the possibility of desktops loaded only with a browser for accessing corporate databases, once again taking the power of the desktop away from the user and putting it back in the hands of the systems manager. While that is conceivable, chances are that corporations will play a game of balancing the applications for a while, placing software needed by select individuals on the

desktop, and placing other more widely used software on a departmental or corporate server.

In fact, Web-based networking goes a step further to fulfill the promise of client-server. The dumb terminals of the 1980s had the power to access only one type of host computer. The Web-enabled computers of today will be able to access various host computers, databases, application servers and other resources within and without the corporation. Rather than limiting the possibilities with simple dumb terminals, browsers and Web-enabled software allow for new combinations of hardware and software. System managers can choose the equipment for each task without worrying about how to unify the data or train the users.

— Kristine Grow has 8 years experience in computer publishing and has written extensively about client-server computing.

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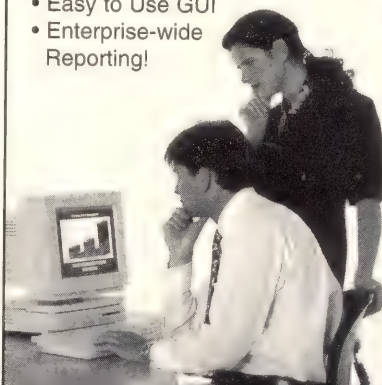
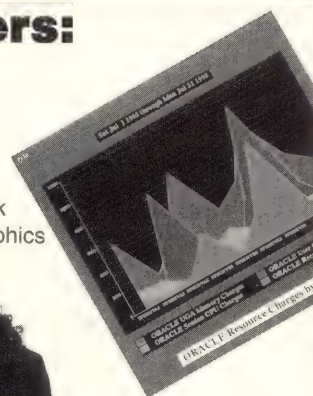
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Upgrade Tools And Coffee Pot Lids

I kept at least one New Years' resolution: I replaced my coffee pot lid. Why? Because I got tired

of wiping up spilled coffee every morning. A hole in my chin? Not quite. But I did have a hole in my coffee pot lid. So, I sat and figured it out.

STICK WITH ME HERE

One minute per wipe (got to rinse the rag ya' know), four cups of coffee per morning — that's about 28 minutes per week. Round it to 30 minutes, and we are talking 26 hours per year I spend wiping coffee! The hour I spend going to the store to buy the new one will save me 25 hours over the course of the year. Wow! That's a good return on an investment.

So is using the upgrade tools that HP provides with HP-UX 10.x. However, getting the tools to work as well as you want, will take some time up front. But in the long run, it will save lots of editing. The tools I am referring to are called the "upgrade" tools, and are often called the "pre-upgrade" tools because they are usually used well in advance of an upgrade. The function of these tools is to search through files and determine if they need to be changed to run properly on HP-UX 10.x. They also will perform many changes automatically, especially if you tune them to your needs. The tuning is where the time invested up front pays off in the long run.

The kinds of files the tools will "fix" includes: shell scripts, source code, make files, documentation and

readme type files, and even some files you might not automatically think of, like crontab files, and perl or other non-shell type scripts. The reason it will fix some documentation files and perl scripts, is due to the many file and pathname changes in HP-UX 10.x. It will make recommendations on changed pathnames, obsolete pathnames, and even warn about shell commands used in non-shell scripts that have changed (for example, if you call a shell command from within a perl script). The tools themselves are shipped in the HP-UX 10.x SDU file-set named "Analysis-Tools." They are also available in HP-UX 9.x install format. I found that this was not necessary, as long as there is an HP-UX 10.x system in the network with the upgrade tools loaded.

GETTING LOADED

On HP-UX 10.20 the tools are loaded into the /opt/upgrade directory. On HP-UX 9.x, they would be loaded into /upgrade directory. You can NFS mount the HP-UX 10 tools onto HP-UX 9.x; they are binary compatible. Here is how I mounted them. These commands were issued on the HP-UX 9 host:

```
hpux9# mkdir /upgrade
hpux9# /etc/mount hpux10:/opt/upgrade /upgrade
```

Remember that the HP-UX 10 host (named hpux10 in the example

above) must export the /opt/upgrade directory. Looking closer at the tools themselves, here is a listing of the "upgrade" directory:

```
hpux9# ls /upgrade
bin lib share
hpux9# ls /upgrade/lib
CMDS_DB DEV_DB LIBS_DB
TTDB t1_ttdb t1_ttdir
```

The **ls** command shows that the tools have a bin directory. For the commands we will be covering next, it also shows a share directory, which has the man pages, and a lib directory. The lib directory contains the database files used by the upgrade tools. The *DB files are plain text, and are often read directly by the person doing the upgrade of files to HP-UX 10.x. At about this time, I expect a number of you to say "all my code and scripts from HP-UX 9 still work at HP-UX 10, so why upgrade?" Well, the reason many scripts and hard-coded pathnames in source code do not break is due to the transition links that HP included in the default HP-UX 10 load. These transition links are what make things like: /etc/checklist work. There is no /etc/checklist file on HP-UX 10, so any script that references that pathname should fail. Instead, HP put in a "transition link" named /etc/checklist that points to /etc/fstab.

This was done so that less work is required to upgrade to 10.x, but eventually those transition links will go away. Looking forward to that time, you should fix all your files so they do

not use obsolete pathnames, even if they work. For example, it turns out

that in /etc alone there are 164 transition links. If you issue the

`/opt/upgrade/bin/tllist` command on HP-UX 10.x, you will see 507 incorrect pathnames that are "fixed" with transition links. It would be smart to get these pathnames correct in your scripts.

If you want to see if your script will work without the links, you can issue `/opt/upgrade/bin/tlremove` on an HP-UX 10.x machine, then run the script. There is also a `tlinstall` command that will put the transition links back. Note that any symbolic links with the "sticky bit" set in the group permission X right location is a transition link (rights that end in T or t, such as `-r-xr-xr-t`). Also note that in addition to the pathnames that have changed, there are also many commands that changed, as well as changed libraries, system calls and header files.

ANALYSIS-TOOLS

The tools themselves consist of three commands: **fnlookup** translates pathnames from 9.x to 10.x, and 10.x to 9.x. **prepare** creates lists of files that need modifications. It will also act as a front-end to **analyzer**. **analyzer** does the actual parsing of a file, creating a modified copy that contains changes, and comments about needed changes.

The general order of usage of these tools is as follows:

1. Run the command **prepare -h** and read the voluminous help information explaining the whole procedure. This is like a tutorial about **prepare**.

2. Run **prepare -g -r <target-directory>** which will create five files (1.SHELL.g, 1.SRC.g, 1.TEXT.g, 1.ELSE.g, and 1.SKIP.g.) that contain a list of files that match a certain profile. If you run the command again from the same directory, it will then create files that start with 2 instead of 1. You can edit these files to comment out, or remove names that you don't want to have acted on by the next steps. You could also add names to the files.

3. Run **prepare -q -f <each-file-named-above>** (for example, **prepare -q -f 1.SHELL.g**). This will do a quick check on each file listed in the *.g file supplied. The purpose of this is

to remove names of those files that need no modifications. This step creates yet another list file, this time with the .g removed. This is the list of files that need to be upgraded. Steps 2 and 3 can be combined into one step, using the "beginner" option of **prepare**:

```
prepare -b -r <directory>
```

4. Run **prepare -v -L \$ -S \$ -f <listfile> -m <target-directory>** (for example, **prepare -v -L \$ -S \$ -f 1.SHELL -m new_10_files**). You would run this version of the command for each of the files that need modifying, that is: 1.SHELL, 1.SRC, 1.TEXT, and possibly 1.ELSE. This will create an edited copy of the files under the directory named in the **-m** option. **prepare** calls **analyze** to perform the actual work of editing the files to HP-UX 10. The **-L** and **-S** options to **prepare** told it to create a log and summary file. The **\$** in the command meant to name the log file after the input file (recommended). Browsing these files will let you know what **analyze** did, and if there are any manual changes needed.

5. Of course, the last step is to perform any manual edits mentioned in the log files, and then re-qualify (test) the modified files created by **analyze**. The newly created files will retain their pathname components, so it is likely that you will specify a **-m** option directory that is the mount point into an HP-UX 10 machine. For example, if you had a collection of scripts in the `/usr/local/bin` directory of an HP-UX 9 host, you might issue commands such as this:

```
cd /usr/local/bin
prepare -b -r .
prepare -L $ -S $ -m /net/hp-ux10 -f 1.SHELL
```

This would create edited copies of the shell scripts in the `/usr/local/bin` directory over on the host named `hp-ux10`, under the `/usr/local/bin` directory.

SUITS ME JUST FINE

If you have lots of source, scripts or documentation files to edit, you might want to do some customization to **prepare**. Some of this can be done with the `.prepare.rc` file, which is created in

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your current directory when you run **prepare** for the first time. Using this file, you can determine which files to skip, what category to place files in, which options **analyze** should use when editing files, and even alternate customized databases to use.

Real power can come from editing the databases to suit your specific needs. You can perform your own modifications such as new mount points for pathnames, or select new methods if you used some obsolete commands.

Here is the original script, written for HP-UX 9.x:

```
#!/bin/ksh
progrname=$(basename $0)
case "$progrname" in
psg) ps -f | grep -f $1 ;;
apsg) ps -ef | grep -f $1 ;;
esac
```

It checks to see which name the program was called with (it is hard linked as psg and apsg). Next, it does a **ps** piped to **grep** to list only those processes that match the pattern supplied. For example: **psg leaf** would only list processes that had the string **leaf** in the name.

After running the script through **analyze** (with **prepare** doing the work, as described in the steps above), here is the new version of the script:

```
#!/usr/bin/ksh
progrname=$(basename $0)
case "$progrname" in
psg) ps -f | grep -f $1 ;;
#analyzer, Line 5: Command "ps", CHANGED, see CMDS_DB entry C_186
#analyzer, Line 5: Command "grep", WARNING, see CMDS_DB entry C_095
apsg) ps -ef | grep -f $1 ;;
#analyzer, Line 7: Command "ps", CHANGED, see CMDS_DB entry C_186
#analyzer, Line 7: Command "grep", WARNING, see CMDS_DB entry C_095
esac
```

Note that the first line was correctly changed from `/bin/ksh` to `/usr/bin/ksh`, as that is the new location for most user commands. However, some less than adequate changes followed. Two comments were added (twice) that warn us about changes to the **ps** and **grep** commands. In those instances, we didn't use any of the new options or changed behaviors to those commands. It warned us anyway. We can strip out the **#analyzer** lines after determining that these lines

are OK. We also can change the databases, or **analyzer** options to prevent these unneeded warnings.

A handy command to see if we need to make a modification goes like this: Let's assume that this script is on an HP-UX 9.x machine, and that I have loaded the tools (or mounted them) into the default location of `/upgrade`. If that is true, then the following would print the command database entry that describes changes to **grep**:

In this case, we would see that no changes are required to the script. By changing the logging options, you can even have all the database information inserted into the script, this might be handy at first.

Remember that if you use lots of scripts, you might make many runs of the tools. First to determine what needs to be changed, then to customize the tools to make as many changes as possible automatic, then finally, a pass to get a "best approximation" of what your HP-UX 10.x versions will look like. Some manual editing will still be needed. And that's good. I like to think of it as job security.

Coffee's on.

—No use crying over spilled coffee. Tell Fred about your Joe woes and time-saving techniques at frederm@aol.com.

Would you like to continue to see articles on this topic?
Circle on reader card yes 304 • no 303

Call For Articles

HP Professional is looking for Case Studies focusing on the HP 9000 in Client-Server Environments. Send proposals to Editor-in-Chief Charlie Simpson. simpsoncm@cardinal.com

Here's Looking At You, Kids

Because no column in the first quarter of any year in the computer industry is complete

without predictions, I would like to thank my sponsor for allowing me to bring you the following:

Prediction 1: The Human Genome Project (HGP) will stumble across a gene that determines a technical guru's development.

Prediction 2: A 90 percent representation of CEOs and MIS in the .COM domain will donate an undisclosed amount of money toward the HGP's diversion to this new area of genetic science.

Prediction 3: "Internet In A Box" computers will enter the year like a lion and leave the year like a lamb. Consumers across the nation will compare the laptop to the bell-bottom craze by the year's end.

Prediction 4: 1997 will see ISPs in arbitration over censorship, as unhappy parents make adult-oriented Web sites earn their money the old fashioned way, by defending their right to it in court.

NOW FOR SOMETHING YOU'LL REALLY LIKE

Welcome to my first column. By now you must know that predictions aren't really my forte. Nevertheless, I hope

you're still reading, because this column *is dedicated* to the hard working, talented individuals in the thankless technical occupations of every company around the globe. They are the unsung heroes — glassy-eyed individuals with one ear glued to the phone, and the other poised to hear the cries of the undertrained and the overwhelmed. This column is for all of you. And you know who you are.

But what shall we talk about? There are several topics that I would like to cover during the course of the next year. For example, IPv6's future. IPv6 is a pipe dream right now and migration to it as a standard is not getting any "closer to implementation." I'll also delve into the issues that carry over from the difficulty of IPv6 implementation to the future of Web-Based Enterprise Management (WBEM).

In a two-part series, I'll explain the differences between the current implementation of NT's domain structure and how StreetTalk for NT affects its future. I'll also explore implementation strategies based on real life war stories submitted by those who have now or

will soon complete a migration to StreetTalk for NT in a WAN or MAN environment. We will discuss the pros and cons and help you see the entire "WANscape." If you are an intranet manager or technician and you have any praise, complaints or stories about the StreetTalk product implementation for NT, feel free to send e-mail to greg@webnology.com.

SMALL TOWN, HIGH HOPES

Small town ISPs are the hot dog stands of the Internet. They're not half as risky as investing in pork bellies, and they carry with them as much promise as the current growth statistics for the Web. I'll explore these mom-and-pop organizations and some of the difficulties associated with putting them together. We'll consider the good and the bad, alert you to potentially ugly mistakes and advise you of the subtle strategies that can make you ISP.

The SNMP packet organization is not as "simple" to understand as the name might suggest. Much work went into this protocol, and it's as complex as any. I will explore the internals of SNMP, and perhaps even decode some of it.

Of course, during the year, I will answer your mail. So, if you have something on your mind or need to get off your chest, or want to see other topics covered here, by all means let me know. If it's within my expertise, and my editors agree, I will explore it.

—Help Greg start his column by sending e-mail to greg@webnology.com.

This month, we introduce Greg Barnes, our new Inner Networking columnist. Greg is a Network/Systems integrator with the United States Air Force and also a consultant for an Internet Service Provider in Texas. His experience with the Air Force has been packed with diverse levels of mainframe, mobile/fixed telecommunications, network and small computer operation and integration experiences. As a UNIX-phile, he has a penchant for Microsoft jokes. However, you can expect him to call them like he sees them.

Would you like to continue to see articles on this topic?
Circle on reader card yes 306 • no 305

new Products

SOFTWARE

AllPen Software Announces AllPen Mobile Forms Database

AllPen Software Inc. announced their AllPen Mobile Forms Database product for Microsoft Windows CE handheld platform. It allows users to create their own customized forms without the need for a desktop application. Custom forms are created on the Windows CE device to fit the users database requirements.

AllPen's Mobile Forms Database is available for \$79.

Contact AllPen Software Inc., 51 University Dr., Ste. J, Los Gatos, CA 95030; (408) 399-4800; info@allpen.com; www.allpen.com.

Circle 400 on reader card

Cross Access Launches Data Access Middleware

Cross Access Corp. unveiled the CrossAccess Data Delivery System for the Fujitsu MSP mainframe operating environment. The announcement was made in conjunction with the official release of CrossAccess Version 3.0.

Supported client platforms include: HP-UX, MVS, AIX, OpenVMS for Digital VAX and AXP, Sun OS and Solaris, SCO UNIX, Windows, Windows NT and Windows 95. Supported server platforms include: HP-UX, MVS, AIX, OpenVMS for VAX and AXP, SunOS and Solaris, SCO UNIX and Fujitsu MSP. Access to Datacom/DB, DB2, IDMS, IMS, Ingres, Model 204, Oracle, Rdb, RMS, System 2000, Sybase, VSAM and sequential data structures is supported.

Contact Cross Access Corp., One Tower Lane, Ste. 2410, Oakbrook Terrace, IL 60181; (800) 982-9911; sales@crossaccess.com; www.crossaccess.com.

Circle 399 on reader card

Kansmen Introduces LittleBrother

Kansmen Corp. introduced its LittleBrother network and Internet/intranet monitoring software, which allows system administrators to analyze usage, limit unproductive activity and block sites not related to work.

LittleBrother tracks and analyzes network use, and LittleBrother Professional Edition includes all the functionality of LittleBrother with added site blocking features. LittleBrother starts at \$295; LittleBrother Professional Edition starts at \$495. Both versions run on a Windows NT machine connected to an Ethernet network.

Contact Kansmen Corp., P.O. Box 360070, Milpitas, CA 95036; (408) 263-9881; info@kansmen.com; www.kansmen.com.

Circle 398 on reader card

NobleNet Offers RPC 3.0

NobleNet introduced RPC 3.0, a Remote Procedure Call middleware. New features include integrated security, naming, load balancing, asynchronous operation, multi-threading and server management.

NobleNet RPC 3.0 costs \$5,000 per developer seat plus a one-time distribution charge for application deployment. It is available on most UNIX platforms, Windows 3.1, Windows 95 and Windows NT, Macintosh, OpenVMS and VxWorks.

Contact NobleNet, 337 Turnpike Rd., Southborough Technology Park, Southborough, MA 01772; (508) 460-8222; sales@noblenet.com; www.noblenet.com.

Circle 397 on reader card

WebManage Technologies Releases NetIntellect V2

WebManage Technologies Inc. updated NetIntellect V1.1, a Web server log analysis tool that provides statistical, geographical

and marketing data about Web sites.

New features include: auto mailing, append/combine log files; BPA standard report; summary reports; FTP; scheduler; multiple domain processing; referral information; organizational database; browser/platform information; most requested page types; top entry pages; and peak day of the week. Price is \$149.

Contact WebManage Technologies, 70 W. Red Oak Lane, White Plains, NY 10604; (914) 697-7555; info@webmanage.com; www.webmanage.com.

Circle 396 on reader card

Datametrics Adds AutoWeb For ViewPoint

Datametrics released the AutoWeb feature for ViewPoint, a PC-based, multiplatform, real-time performance monitor and system tuning tool. AutoWeb allows you to view live system data from a platform that has a Web browser, from anywhere in the world.

AutoWeb turns ViewPoint into a Web server. When system users experience problems, they can access the AutoWeb server and see where the problems exist.

Contact Datametrics Systems Corp., 12150 E. Monument Dr., Ste. 300, Fairfax, VA 22033; (703) 385-7700; experts@datametrics.com; www.datametrics.com.

Circle 395 on reader card

Bristol Technology Unveils Jprinter

Bristol Technology Inc. announced Jprinter, a WYSIWYG PostScript and HP PCL network printing system for Java.

Jprinter is available for HP-UX, Windows NT, SunOS, Solaris, Digital UNIX, OpenVMS, SCO UNIX, IBM AIX and SGI Irix workstations, and IBM OS/390 mainframes.

Contact Bristol Technology Inc., 241 Ethan Allen Hwy., Ridgefield, CT 06877; (203) 438-6969; info@bristol.com; www.bristol.com.

Circle 394 on reader card

Ryan McFarland Releases RM/COBOL v6.5

Ryan McFarland, a division of Liant Software Corp., released RM/COBOL v6.5, an ANSI-standard compiler, providing for full 32-bit support for Windows 95 and Windows NT. V6.5 enables one common RM/COBOL runtime system or compiler to execute under either Windows 95 or Windows NT without recompiling.

New features include: automated

retrieval of current year digits for addressing Year 2000 issues; support for the Windows registry; and expanded support for Windows 95 and Windows NT conventions such as long filenames, 3D controls, right mouse button/pull down menu support, and automated system installation and removal facilities.

Contact Ryan McFarland, 8911N. Capital of Texas Hwy., Ste. 4300, Austin, TX 78759; (800) RM-COBOL; rm_info@liant.com; www.liant.com/rm.

Circle 392 on reader card.

Verity Enhances HP Online

Verity Inc. announced that it will enhance HP's online product information and support tools by integrating them with Verity's CD-Web publishing technology.

At scheduled intervals, HP will replicate some content from www.hp.com onto CD-ROMs enabled with Verity's search technology. These CDs can be bundled with other HP products or distributed independently to customers and resellers. Users searching for HP information can pull the results directly from the local CD. If they also have an Internet connection, they can link to HP's Web site to augment the CD search results with any updated or additional materials.

Contact Verity Inc., 894 Ross Dr., Sunnyvale, CA 94089; (408) 541-1500; info@verity.com; www.verity.com.

Circle 391 on reader card.

InoTech Announces OpenView-Web Server Toolkit

InoTech released its OpenView-Web Server Toolkit which facilitates viewing HP OpenView maps and event information via a Web browser. A list of available maps is presented in a scrollable frame. Event information is also presented in a scrollable frame at the bottom of the Web page, and may be filtered based on severity, date, source or description. The Toolkit requires a dedicated X Window display (X terminal or PC running X emulation).

Contact InoTech, 2222 Gallows Rd., Tyson's Corner, VA 22027; (703) 641-0469; info@inotech.com; www.inotech.com.

Circle 390 on reader card

Epilogue Technology Releases Decorum

Epilogue Technology Corp. introduced Decorum, a solution that uses the Web for network management. Decorum sends and receives HTML packets, converting them

to and from an HTML-readable form so network devices can be managed using conventional Web browser technology.

Contact Epilogue Technology Corp., 11116 Desert Classic Lane NE, Albuquerque, NM 87111; (505) 271-9933; info@epilogue.com; www.epilogue.com.

Circle 389 on reader card

Net-It Software Launches Net-It Now!

Net-It Software launched Net-It Now!, a software application that lets Windows 95 users transform regular desktop documents into live, instantly viewable Web pages that do not require software plug-ins or other special set-up to access from virtually any computer that is connected to the Internet.

The enabling technology for Net-It

Thanks to Harmonizer, over 3000 Aldon customers are humming a new tune about installing new packaged software releases.

A classic from the Aldon repertoire. Harmonizer.

Harmonizer allows you to make modifications to your software applications and still take advantage of new releases.

In fact, Harmonizer can save you 60-80% of the time you now spend putting up new releases.

Harmonizer identifies and reports all changes made by you and by the vendor on a new release, then merges your changes with the new release to create new production versions of your programs. It's that simple.



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CIRCLE 163 ON READER CARD

Now! is jDoc, a cross-platform software technology for displaying, distributing and interacting with live Web pages.

Net-It Now! for Windows 95 costs \$149 per single-user license. Site-license pricing options are also available.

Contact Net-It Software Corp., 1550 Bryant St., Ste. 220, San Francisco, CA 94103; (888) NETIT NOW;

feedback@net-it.com; www.net-it.com.

Circle 388 on reader card

Pilot Unveils Decision Support V5

Pilot Software Inc. announced the availability of the Pilot Decision Support Suite version 5, which enhances analysis of corporate data warehouses by combining the strengths of OLAP, predictive modeling and sophisticated visualization.

Pilot's initial decision support components — Pilot Desktop, Pilot Analysis Server, Pilot Designer, Pilot Analysis Library and the Pilot Excel Add-in, as well as the data mining component, Pilot Discovery Server, are now available.

A five concurrent-user configuration of Pilot Decision Support Suite starts at \$30,000.

Contact Pilot Software Inc., One Canal Park, Cambridge, MA, 02141;

(617) 374-9400; pilotinternet@pilotsw.com;

www.pilotsw.com.

Circle 387 on reader card

Rainbow Provides SentinelWizard GUI

Rainbow Technologies Inc. unveiled the SentinelWizard GUI, part of the latest software release for the SentinelPro, which

guides developers in implementing and integrating advanced protection into their SentinelSuperPro key. Developers simply describe how they want to sell their products, SentinelWizard then automatically programs their SentinelSuperPro key that generates pseudo code to complete the protection process.

Contact Rainbow Technologies, 50 Technology Dr., Irvine, CA 92718;

(800) 852-8569; www.rnbo.com.

Circle 385 on reader card

Lexmark Extends MarkVision's Support

Lexmark International Inc. added MarkVision for Windows NT 4.0 to its network printer management software products. MarkVision provides printer and printing management, complete print driver support and integration with the Windows NT 4.0 print subsystem.

MarkVision includes: real-time remote printer access; alert-driven architecture; distributed printer visibility; end user and administrator capabilities; support for Windows NT-based platforms, including Intel, Digital Alpha, MIPS and PowerPC; common graphical interface; and cost-saving management reports.

Contact Lexmark International, 740 New Circle Rd., NW, Lexington, KY 40511; (800) 891-0331; www.lexmark.com.

Circle 384 on reader card

Reflection Suite for HP V5.5 Shipped By WRQ

WRQ shipped Reflection Suite for HP version 5.5 for Windows 95 and Windows NT, a complete 32-bit solution that delivers high-performance PC access to HP 3000 and HP 9000 hosts over TCP/IP.

It offers a single package providing WRQ's Reflection TCP/IP stack for Windows 95, robust 32-bit networking applications, NS/VT, HP 3000 networking optimizations and industry-standard HP emulation. Single copy price is \$599.

Contact WRQ, 1500 Dexter Ave. N., Seattle, WA 98109; (800) 872-2829; info@wrq.com; www.wrq.com.

Circle 383 on reader card

Geodesic Systems Releases Great Circle For HP-UX

Geodesic Systems Inc. released Great Circle for HP-UX, which uses garbage collection technology to automatically eliminate memory bugs in C and C++ source code, third-party libraries and legacy code.

Geodesic's Great Circle 1.03 supports SoftBench, HP C and C++, and g++ on

New From HP

HP Internet Advisor — HP added the inter-switch link (ISL) protocol from Cisco Systems Inc. to its HP Internet Advisor data communications test tool. The new enhancement helps network managers of virtual LANs understand and optimize their VLANs rather than just troubleshoot them using time-consuming protocol-decode capabilities.

The HP Internet Advisor is an integrated data communications test tool for LANs, WANs and high-speed networks, including switched, full-duplex Fast Ethernet, ATM and FDDI. It maximizes network uptime by helping network managers and service providers anticipate problems. The VLAN test capability runs on the Fast Ethernet undercradle (HP J3444A).

The VLAN test capability comes standard with the HP Internet Advisor Fast Ethernet undercradle for \$15,000. The HP J2899A+UAF software update subscription service is \$1,800.

Spaceball 3003 On HP Graphics Workstations — HP and Spacetec IMC Corp. announced that they have entered into an agreement where HP will sell and market the Spaceball 3003 3D input device for workstation-based mechanical design and engineering. Available for HP Visualize B-, C- and J-class workstations, the Spaceball 3003 facilitates the design process by increasing interactivity between the mechanical designer and the model.

Coupled with HP workstations, the Spaceball supports the following MCAD applications: HP SolidDesigner, IBM CATIA Computervision CADD5, SDRG I-DEAS Master Series 4 and CAMAND, McNeal-Schwindler PATRAN, PTC Pro/ENGINEER and PT/Products, Matra Datavision Euclid3, Megavision and Strim, and EDS UNIGRAPHICS.

The Spaceball 3003, including SpaceWare (a device driver that enables the Spaceball 3003 and HP workstations to interact with the design application), is \$695.

HP ESA-L1500A — HP announced the HP ESA-L1500A, a fully synthesized spectrum analyzer that is designed for field test managers who install, maintain or repair telecom or two-way radio infrastructure equipment. It also shortens test and repair time in addition to improving test reliability.

It has one-button measurements for bandwidth, third-order intercept (T.O.I.) and amplitude modulation. A back-lit, high-resolution digital display makes test results easier to see, and technicians can view large and small signals simultaneously with 85 dB of log display range.

The HP ESA-L1500A 1.5Ghz RF Spectrum Analyzer is \$7,300. A 50-ohm tracking generator option is available for \$3,000, and a 75-ohm tracking generator option is \$3,000.

For more information, contact your local sales office or call (800) 533-1333.

HP-UX 10.10 and 9.0x. It also supports SunOS and Solaris.

Contact Geodesic Systems Inc., 4745 N. Ravenswood Ave., Ste. 111, Chicago, IL 60640; (800) 360-8388; info@geodesic.com; www.geodesic.com.

Circle 382 on reader card

Sucaba Introduces Internet Outsourcing

Sucaba Co. Inc. announced a risk management information system connectivity solution for their HP 3000-based On-Line Claims Information System (OLCIS), with the introduction of Internet outsourcing.

Using a local Internet service provider, users access the OLCIS system with their current standalone or networked PCs running MPE, Windows, Windows 95, Windows NT, DOS, Mac, OS/2 or UNIX.

Contact Sucaba, 794 E. Walnut St., Pasadena, CA 91101; (818) 440-1676; s_mead@sucaba.com www.sucaba.com.

Circle 381 on reader card

Galacticomm Inc. Offers Worldgroup 3.0

Galacticomm Inc. released Worldgroup 3.0 for Windows NT and Windows 95. Worldgroup 3.0 is a native 32-bit software which includes Active HTML — a platform-level integration of thin-client technology which allows Worldgroup applications to dynamically generate HTML pages.

Active HTML is powered by DynaFiles. And, Java Applets, ActiveX controls and other objects also can be embedded in to DynaFile templates.

Contact Galacticomm, 4101 SW 47th Ave., #101, Ft. Lauderdale, FL 33314; (800) 328-1128; sales@gcomm.com; www.gcomm.com.

Circle 363 on reader card

Momentum Introduces XIPC Middleware

Momentum Software Corp. announced XIPC, an advanced software toolset for the development of multitasking and distributed applications. XIPC provides fault-tolerant management of peer-to-peer messaging, message queuing, semaphores and shared memory. It is a middleware tool that treats IPC programming as a single problem, regardless of the location of the involved processes, and regardless of the variety of operating system, network protocols and hardware platforms being used.

Contact Momentum Software Corp., 401 S. Van Brunt St., Englewood, NJ 07631; (201) 871-0077; www.momsoft.com.

Circle 361 on reader card

Research Systems Announces IDL V5.0

Research Systems Inc. announced IDL version 5.0, which includes a suite of mathematics, statistics, graphics, image processing, mapping and general data manipulation features in an integrated, high-performance package.

New features include: a pre-built GUI, called IDL Insight; support for OpenGL; true interactive graphics capabilities; a new object-oriented graphics architecture; and an IDL Object System.

IDL 5.0 is available for Windows 3.1, Windows 95, Windows NT, Macintosh, Power Macintosh, UNIX (HP, Sun, SGI, Digital and IBM), Linux and OpenVMS. Windows, Macintosh and Linux pricing starts at \$1,500. UNIX and OpenVMS pricing starts at \$3,495.

Contact Research Systems Inc., 2995 Wilderness Place, Boulder, CO 80301; (303) 786-9900; info@rsinc.com; www.rsinc.com.

Circle 360 on reader card

HARDWARE

MAXSTRAT, Fujitsu Ltd. Announce Strategic Relationship

MAXSTRAT announced a strategic relationship with the HPC Group of Fujitsu Ltd. Under the agreement, Fujitsu will market, sell and support MAXSTRAT's line of storage servers. MAXSTRAT's products will be supported on Fujitsu's VX, VPP300 and VPP700 Vector Parallel High Performance Computers and Fujitsu's new AP3000 Parallel Servers.

MAXSTRAT's Gen5 and S-Series families of storage servers are optimized for the high-capacity, high-performance fibre channel, HIPPI and SCSI data-intensive storage market. They provide high-bandwidth data transfer concurrently on up to eight independent SCSI host connections, four fibre channel connections or four independent HIPPI channels.

Contact MAXSTRAT, 801 Buckeye Court, Milpitas, CA 95035; (408) 383-1600; info@maxstrat.com; www.maxstrat.com.

Circle 380 on reader card

Accton Technology Releases 10BaseT-to-Fiber 10/100 Switch

Accton Technology announced the Smart 2-port Fast Ethernet Switch, which can be used like a conversion switch to interconnect 10BaseT and 100BaseT Fast Ethernet links, or as a repeater to extend the cabling distance of Fast Ethernet links. This unit extends 10/100Mbps connectivity to fiber users.

Contact Accton Technology, 1962 Zanker Rd., San Jose, CA 95112; (800) 926-9288; support@accton.com.tw; www.accton.com.

Circle 379 on reader card

SBE Inc. Ships ISDN ThunderCard

SBE Inc. announced shipments of the ThunderCard ISDN PC card for use in the netXpand family of remote access routers — ROUTEMAN, SoHo and Central. The ThunderCard comes pre-configured and ready to use multilink PPP for 128Kbps speeds. With STAC LZS compression, data throughput can reach 512Kbps.

It is compatible with Windows 95 and Windows 3.1. The ThunderCard without an NT-1 device costs \$399, and with an NT-1 costs \$598.

Contact SBE Inc., 4550 Norris Canyon Rd., San Ramon, CA 94583; (800) 214-4723; netxpand@sbei.com; www.sbei.com.

Circle 378 on reader card

Proxim Introduces RangeLAN2

Proxim Inc. announced two new products in its 2.4GHz RangeLAN2 RF wireless LAN product family.

The RangeLAN2 7400 PC Card is a one-piece PC Card adapter. Also, the new RangeLAN2 PC Card provides interchangeable antennae, allowing users to select the antenna that matches their specific device and coverage needs.

The RangeLAN2 AP-II 7510 and 7520 Access Points provide higher performance through a RISC processor. The Access Points can be easily mounted in a variety of locations including ceilings, walls and cubicles.

The RangeLAN2 products connect to standard Ethernet networks and support Windows 95, Windows NT, Windows for Workgroups, ODI, NDIS, Novell NetWare, Banyan Vines and Artisoft LANtastic.

Price is \$695 for the RangeLAN2 7400 PC Card, and start at \$1,895 for the RangeLAN2 AP-II access points.

Contact Proxim Inc., 295 N. Bernardo Ave., Mountain View, CA 94043; (800) 229-1630; www.proxim.com.

Circle 377 on reader card

Plasmon Adds M20J-695 Jukebox

Plasmon Data Inc. announced an addition to its M-series jukebox line, the M20J-695. This 20-slot, 50GB MO jukebox with 2.6GB Cheetah Plus drive offers a quieter mechanism, filterless maintenance-free opera-

tion, improved tip-out LCD panel, push-button import/export element and differential SCSI option. It replaces the RF20J-695.

Price is \$6,995 for the single drive, \$9,995 for two drives.

Contact Plasmon Data Inc., 2045 Junction Ave., San Jose, CA 95131; (800) 445-9400; sales@plasmon.com; www.plasmon.com.

Circle 373 on reader card

Axis To Support Nakamichi's CD Changer

Axis Communications Inc. announced support for Nakamichi's MJ-4.8s CD-ROM changer through a firmware upgrade, V2.13, to its family of CD-ROM servers. Along with supporting Nakamichi's CD-ROM standard, the Axis 850/950 (Ethernet and Ring) allows users in NetWare, Windows NT, Windows 95, Windows for Workgroups, OS/2, UNIX and Web/intranet environments to seamlessly and simultaneously share CD-ROM-based information over a network.

Using the Axis 850/950, users have peer-to-peer access for up to seven Nakamichi MJ-4.8s CD-ROM changers. Nakamichi's MJ-4.8s CD-ROM changer

allows users to access four CDs per unit. Using Axis' 850/950 with Nakamichi's MJ-4.8s, up to 28 online CDs can be accessible on a network.

Contact Axis Communications Inc., 4 Constitution Way, Woburn, MA 01801; (800) 444-AXIS; info@axisinc.com; www.axisinc.com.

Circle 372 on reader card

Tecmar Releases DDS-2 Tape Drive

Tecmar Technologies Inc. unveiled its WangDAT 3800 high-performance DDS-2 tape drive based on its next generation DAT platform. The model 3800 has a transfer rate of 1.5MBps and features 100X speed search mode enabling users to locate any file among 8GB of user data in 45 seconds or less.

The WangDAT 3800 drive is fully compatible to its present model 3400DX and is fully backwards compatible with adapters, media and software that supports DDS-1 and DDS-2.

Contact Tecmar Technologies, 1900 Pike Rd., Longmont, CO 80501; (303) 682-3700; info@tecmar.com; www.tecmar.com.

Circle 369 on reader card

Imperial Technology Delivers MegaRam-3000

Imperial Technology announced the MegaRam-3000, which features SCSI-2 Fast & Wide interfaces with a transfer rate of 20MBps per port, an access time of only .035ms and a capacity range of 67MB to 3.018GB.

It can be configured with redundant power supplies and an internal backup disk drive. Other features include optional extra SCSI interface ports (up to four), and advanced error detection and correction circuitry (EDAC).

Contact Imperial Technology Inc., 2305 Utah Ave., El Segundo, CA 90245; (800) 451-0666; itmarketing@imperialtech.com; www.imperialtech.com.

Circle 368 on reader card

Conley Unveils SR-50 RAID Subsystem

Conley Corp. released a high-performance, high-availability RAID subsystems that provides a fibre-channel connection that can be shared among multiple host computers.

All single points of failure are eliminated through the use of redundant features such

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CIRCLE 231 ON READER CARD

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Contact Conley Corp., 420 Lexington Ave., New York, NY 10017; (212) 682-0162; info@conley.com; www.conley.com.

Circle 370 on reader card

Boffin Releases 8X CD-ROM Jukebox

Boffin Ltd. released an 8X CD-ROM jukebox that moves 28 discs between seven 8X readers. This 4:1 disc-to-reader ratio permits a swap time of less than two seconds per disc, minimizing the wait for users who require rapid access to multiple CD-ROM applications.

The jukebox, the JB828, is available standalone and rackmount, as well as in special scalable configurations. Each unit has a SCSI-2 port for connection to a host system. Multiple jukeboxes can be connected to the server with each jukebox requiring one single-channel SCSI controller.

Contact Boffin Ltd., 2500 W. County Rd. 42, Ste. 45, Burnsville, MN 55337; (612) 894-0595; sales@boffin.com; www.boffin.com.

Circle 371 on reader card

RTI Announces NetAcquire 3000

Real Time Integration Inc. (RTI) announced NetAcquire 3000, a network data acquisition server that acquires, processes and updates real-time analog data at over 75,000 samples per second. It uses a standard Ethernet network to communicate with a client computer monitoring and displaying the results.

Price is \$8,495, and includes server and client software for Windows 3.1, Windows 95 and Windows NT. Client software drives for SunOS and Solaris, and HP-UX are \$495 each. Optional software includes a Visual BASIC Toolkit (\$195), DAPview for Windows graphing/logging software (\$295) and DASyLab icon-based graphical interface software (\$1,395).

Contact RTI, 7914 140 PL NE, Redmond, WA 98052; (206) 883-7563; realtimeint@realtimeint.com; www.realtimeint.com.

Circle 366 on reader card

QMS Expands Print System Family

QMS Inc. announced two new models of the QMS 2060 and QMS 2425 Print Systems.

Based on QMS Crown technology, the QMS 2060 FX-1 and QMS 2060 FX-2

offer up to 20 ppm, 1,200 dpi and edge-to-edge printing on large format paper. The QMS 2060 FX-2 and the QMS 2425 FX-2 are equipped with a duplexer for double-sided printing, as well as an internal hard drive for image storage, fonts storage and job spooling. The QMS 2425 FX-1 offers 24 ppm printing, QMS Crown technology and advanced paper handling, and is upgradeable to the QMS 2425 FX-2. All

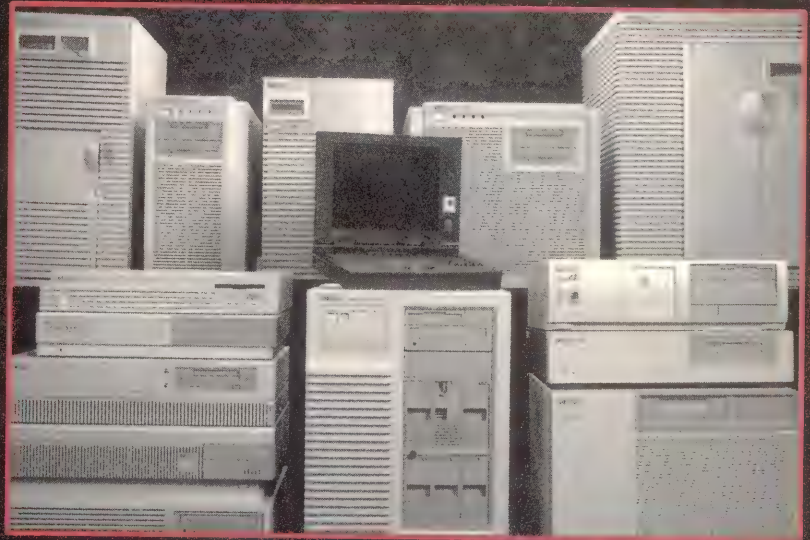
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Contact QMS Inc., One Magnum Pass, Mobile, AL 36618; (800) 523-2696; info@qms.com; www.qms.com.

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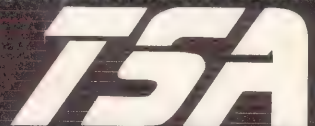
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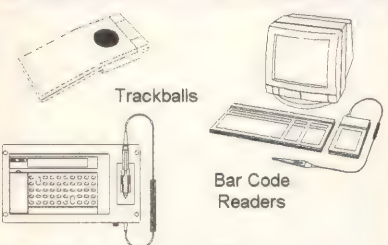
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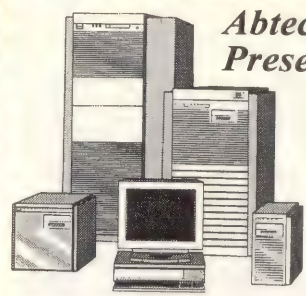

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Ten X Releases New CD-ROM Servers

Ten X Technology Inc. announced a new high-performance server and price reductions on existing products.

The new 24-CD capacity TenXpert-1 System/24p, employing a 1GB hard disk cache, often accesses CD data at 20 times the baseline CD-ROM speed, and costs \$4,995. The TenXpert server family covers the range from seven CDs to over 200 CDs online, and starts at \$2,995.

Contact Ten X Technology, 13091 Pond Springs Rd., Ste. B-200, Austin, TX 78729; (800) 922-9050; support@tenx.com; www.tenx.com.

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HP NetServers Ship With Quantum Hard Drives

Quantum Corp. and HP announced an agreement that enables HP to deliver network servers equipped with 9GB hard disk drives for the Windows NT and Novell NetWare environments.

Beginning last November, HP offered the Quantum Atlas II 4GB and 9GB hard disk drives as an option across its HP NetServer LH Plus, the HP NetServer LH Pro, the HP NetServer LX Pro and the HP NetServer LX Pro systems.

Contact Quantum Corp., 500 McCarthy Blvd., Milpitas, CA 95035; (408) 894-4000; www.quantum.com.

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Cygnat Storage Introduces Turnkey

Cygnat Storage Solutions Inc. introduced the Crossfire CD-mastering system and the Replicator automated CD-production system. Both are designed to support host-independent, error-free recording and production of HyCD compact disks.

Each of the systems are based on a 4X CD-R drive, 1GB hard drive and an intelligent system controller to manage all recording functions independent of the host computer.

Crossfire for PC is available at \$5,995, while Crossfire for UNIX is priced at \$6,995. The Replicator has a price of \$7,995, without software.

Contact Cygnat Storage Solutions Inc., 2560 Junction Ave., San Jose, CA 95134; (800) 7CYGNET.

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RKS Designs ZERO EMI's MAGNUM

RKS Design Inc. released ZERO EMI's MAGNUM, a security camera enclosure. This dust resistant, environmental enclosure

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for security camera applications is a redesign of ZERO EMI's previous product. The camera was designed using HP Solid-Designer software.

This product will be included in the San Francisco Museum of Modern Art's exhibit, entitled "Icons: Magnets of Meaning," which will be displayed from April 16 to September 14, 1997.

Contact RKS Design Inc., 7407 Topanga Canyon Blvd., Canoga Park, CA 91303; (818) 710-9737.

Circle 333 on reader card

Planet Releases New Software Versions

Planet Corp. announced its enterprisewide and desktop versions of Business Maestro, an integrated financial control and planning product that helps managers manage and control groups, departments, divisions and entire companies. The new features include an Internet/intranet capability, the ability to import files from any accounting system or spreadsheet, and enhanced inventory management. Business Maestro is scalable to work for any size business and does not require extensive knowledge or training in spreadsheets or databases.

Both versions run under Windows 95, Windows NT and Windows 3.x. Business Maestro Desktop is priced at \$995. The Enterprise model is \$4,995 for a five-user enterprise pack, and \$750 for each additional user.

Contact Planet Corp., 106 Pleasant St., Worcester, MA 01609; (508) 757-2840; planet@planet-corp.com; www.planet-corp.com.

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StraightLine Introduces SL-800 Tape Libraries

StraightLine announced a new family of robotic tape backup libraries for the computer data storage market.

Like the SL-400 series, the SL-800 series includes advanced software interfaces for subsystem mechanics and diagnostics, and a choice of operating modes including SCSI-2, sequential or serial mode commands. It supports up to four Mammoth or five Sony AIT 8mm tape drives and from 10 to 150 tapes, and features a unique tape drawer for speedy tape loading and unloading. An optional bar code reader also is available. The tape drives — the only parts needing replacement or expansion — are simple to install and replace.

Prices for the SL-800 series range from \$23,995 to \$61,995, depending on configuration.

Contact StraightLine, 677 120th Ave. NE, Bellevue, WA 98005; (206) 865-8314; igm@igm.com; www.igm.com.

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Cybernetics Offers CY-10XP

Cybernetics announced the CY-10XP, a 10GB 5.25-inch hard disk drive that provides an average sustained transfer rate of 27MBps. It features an Ultra SCSI interface, and 8MB data buffer and an 8.5ms seek time. The drive is also host- and operating system-independent and offers a MTBF of 300,000 power-on hours.

Contact Cybernetics, 111 Cybernetics Way, Yorktown, VA 23693; (804) 833-9000; www.cybernetics.com.

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Hooked On Dweebonics (cont. from page 7)

Here is my three-part strategy to make Dweebonics a second language,

1. All teachers in the public school systems need to be trained to recognize Dweebonics. For only after you can talk to a Dweeb can you really understand his or her needs. Know that when a child says "robust" he ain't talking 'bout no wine bouquet. I suggest mandatory attendance at trade shows, small user groups and seminars. The smaller the show, the more Dweeb a teacher will pick up. Finally, try a listserv, however, use extreme caution as the dweebness lurking there can be lethal.

2. Once it is established you have a bona fide Dweeb, do not isolate him or her from the class. Encourage the nerdiness. I/O the dude or dudette. For example, if a student says, "Y'all, it's an integrated non-linear paradigm." Query with, "Yo, didgyah distribute the relational syntax?" Perhaps you'll hear, "I be in an nth-complexity infinite binary loop, cuz." Simply reply, "Like awesome dude. Don't initialize and execute your mainline. Just keep, like, the data from your server's ASCII buffer."

Beware, you may encounter a student mixing Dweebonics with a dialect of Bizbabble. For example, you ask little Johnny and Joanie what they want to be, and they reply with the following: "Our mission is to provide an open enterprisewide solution, by the deployment of an advanced object-oriented, distributed technology of three-tiered client-server architectures in a true multiplatform environment." These students may be beyond mere classroom help. Special counseling is advised.

3. Once identified and interfaced with, the geek's MTBF and his scalability (like that was a word before Dweebonics) should be assessed, and he or she should then slowly be reinitialized into "normal" society. Start by asking "So like, do you have mindshare of Michelangelo?" Meaning: "Do you know who Michelangelo is?" Be careful not to ask, "Do you have Michelangelo mindshare?" That means: "Does Michelangelo know you?" You could wind up looking very undweeb and losing the respect of your other students. If he or she answers, "It wasn't as strong a virus as predicted," you know you still have your work cut out for you. However, if he or she says, "Right on dude, he's my favorite Ninja Turtle," relax, the student is on the way to normalcy.

SAY WHAT?

In no way can Dweebonics denigrate or "hold back" dweebs as many of my opponents are already claiming in this week's *Wall Street Journal* and on NightLine with Ted Koppel. In fact, Dweebonics offers a level playing field for tech weenies who would otherwise fall through the cracks, by providing specific goals, the initiation of critical educational developments, which require considerable input and analysis, as well as a measurable trade off, in order to arrive at the evolution of parameters over a predefined time period. The teaching component, however, must utilize and semi-integrate with a interoperable curricular activity in order to achieve any tangible linear performance gains. Whereas, the language management, on the other hand, adds implied flexibility limits to the total learning paradigm.

In other words, only through isolation, fragmentation, hackification and separation can we ever hope to exist as one people.

Fwiw, this is no :). The FAQs are: Haven't weenies been deprived long enough? Isn't it enough that today's goobs are ridiculed for their pocket protectors and taped up eyeglasses? Don't they have enough FUD to contend with?

So I beg you. I importune you. Without getting all GUI, EDI your city council, your local school boards, and your congressman or woman, and demand that your schools click on the needs of today's young geeks by acknowledging and understanding the language of the future — Dweebonics. Help give all goobs a new lease line on life.

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